

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS

ALLIANCE FOR AUTOMOTIVE)	
INNOVATION,)	Civil Action
)	No. 20-12090-DPW
)	
Plaintiff,)	
)	
vs.)	
)	
MAURA HEALEY, ATTORNEY)	
GENERAL OF THE COMMONWEALTH)	
OF MASSACHUSETTS, in her)	
official capacity,)	
)	
Defendant.)	

* CONTAINS CONFIDENTIAL MATERIAL

BEFORE THE HONORABLE DOUGLAS P. WOODLOCK
UNITED STATES DISTRICT JUDGE

BENCH TRIAL DAY ONE

June 14, 2021

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P R O C E E D I N G S

THE CLERK: Civil Action 20-12090, *Alliance for Automotive Innovation v. Maura Healey*.

THE COURT: I think, as far as I'm concerned, we're ready to go with the first witness, but let me just outline a bit and get your feedback about the day. As I understand it, the desire was to have Mr. Tierney here at 10:00, and if we take Mr. Douglas for 35 minutes, then we'll have Mr. Baltes for a period of time and we'll move forward along those lines.

We'll be sitting from -- receiving testimony from 9:00 to 10:45 and then from 1:15 to 4:30 with a break of about 15 minutes at -- I'm sorry, at 10:45. So we'll be sitting from 9:00 to 12:45 this morning, with a break at 10:45 to 11:00. Then in the afternoon we're going to be sitting from 1:15 through 4:30 with a break at 2:45 to 3:00.

So that's the schedule that I'd like to work on. It's important for the court reporters to be able to rely on that to be able to switch in and out for various activities.

My outline of likely time, relying on your outline of the likely time, is that today we'll have about 390 minutes, and that means that we'll have some of Mr. Chernoby's testimony but not all of it, and then we'll take him up the following day.

Ms. Beatty has done her magic with scheduling. So I think we can anticipate that we'll run until 4:00 tomorrow, and

1 then I have a pretrial in a criminal case, and that on
2 Wednesday we'll probably take a break at 2:00 p.m. for a change
3 of plea that I'll be taking -- 1:00 p.m., pardon me, 1:00 p.m.
4 Excuse me. So we'll adjust it for that. But that's just to
5 give you a longer range, sense of what we're going to be doing.

6 I've looked at and decided to receive as an amicus the
7 single amicus that I received here. I should tell you my views
8 about amicus curiae, but it's useful in framing some issues.
9 They were shared by Judge Aldrich in one of his cases in which
10 a footnote he referred to a friend of his who argued a case
11 before a judge who received an amicus curiae brief on the other
12 side, and he said, What do you think of the views of amicus
13 curiae? And the lawyer for the parties said, Your Honor, that
14 man is no more a friend of the court than I am. So I view
15 myself without friends in the courtroom, but I'm interested in
16 observations. Those were interesting observations. We'll get
17 a chance to talk about them at some point.

18 Now, with respect to the choreography, I'll call it,
19 or at least the introduction of new speaking roles in this
20 drama, I guess my view would be that I'd leave it to you if you
21 want to introduce the deposition testimony in some sequence. I
22 can see the sequence that you have outlined here for me in the
23 presentation of the evidence and, of course, we'll take a break
24 to accommodate people like Mr. Tierney, but if you want to
25 introduce the deposition testimony at certain points, I can see

1 that this is a kind of hierarchy of roles, particularly at GM,
2 but leave that up to you. All I'm going to do is say, Put
3 Mr. Douglas on the stand now.

4 Is there anything else that you need to take up?

5 MR. HASKELL: There is one preliminary thing we would
6 like to address, Your Honor.

7 THE COURT: Sure.

8 MR. HASKELL: That has to do with the confidentiality
9 of these proceedings. We understand that the court will be
10 observing the protective order with respect to trial testimony,
11 and we've done our best to make educated guesses about what
12 portions of our cross-examinations of the plaintiff's witnesses
13 are likely to implicate a matter that the plaintiff has deemed
14 confidential.

15 We wanted to make the court aware that through that
16 analysis, our view is that the plaintiff's first witness,
17 Mr. Douglas, will be entirely nonconfidential, is our best
18 educated guess. The plaintiff's subsequent two witnesses,
19 Mr. Tierney and Mr. Baltes, will be entirely confidential, is
20 our best guess. The following witness, Mr. Chernoby will
21 involve a lot of confidential material but we think we've been
22 able to separate that such that we can do it kind of half and
23 half, and ask to treat a discrete portion of his examination as
24 confidential. And then the plaintiff's final two witnesses,
25 Mr. Bort and Mr. Garrie we believe will likely be deemed

1 entirely confidential.

2 I would be remiss if I didn't say that our client, the
3 Attorney General, is a little bit concerned by the proportion
4 of the evidence in this case that is not going to be available
5 to the public. But that is what it is.

6 THE COURT: Okay. Well, let me just deal with it as a
7 formal matter. I'm going to defer initially to counsel on
8 this. I appreciate your thinking this through. I do recognize
9 that each one -- each side is going to have to make its own
10 determinations about when we get to confidentiality, and when I
11 say "when we get to confidentiality," I would like as best we
12 can to do the confidential materials after the nonconfidential
13 materials, and that means that we're not switching back and
14 forth for those who may be watching on Zoom. I don't know how
15 many, if any, people are watching it on Zoom. But we'll switch
16 on and off in that fashion.

17 With respect to the larger purpose, or larger concern
18 that the Attorney General has expressed, of course I share the
19 same view, but we can review this after the testimony comes in
20 and make it available, and that will involve an analysis of
21 what I understand to be a realtime transcript so you can be
22 doing that on a regular kind of basis. But I want to march
23 through as best we can, as promptly as we can, and then make
24 available as much as seems prudent all of the testimony and
25 evidence that's been received in the case.

1 So we'll proceed along those lines. But with respect
2 to Mr. Douglas, I guess we can go straight into him. All
3 right?

4 Just as a kind of a rubric, it strikes me that it
5 consists of standing up and saying, We tender the declaration
6 of X under oath, and Ms. Beatty will swear each of the
7 witnesses again, although they are under oath, to remind them
8 of the gravity of what they're about to undertake on the stand.
9 Okay?

10 MR. NADOLENCO: Understood, Your Honor. Prior to
11 calling Mr. Douglas, we would move Plaintiff's Exhibits 1
12 through 80 into evidence.

13 THE COURT: Yes. I take it that with respect to those
14 exhibits, that they're going to come in through witnesses and
15 are attached to witnesses who somehow vouched for -- I wouldn't
16 say "vouched for" but sponsored by witnesses. That's the way
17 I'd like to take them. I have them here. Of course I've
18 looked at them over the weekend both in isolation and in
19 connection with particular witnesses, but what I would
20 anticipate happening is when a witness like Mr. Douglas
21 testifies and he's got a couple of exhibits there, that they
22 come in by your tender of them rather than the wholesale
23 introduction.

24 MR. NADOLENCO: That's fine, Your Honor. I believe
25 that's going to leave some stragglers in the exhibits, but we

1 can deal with that down the road.

2 THE COURT: Yes, and what I think would be helpful is,
3 as we go along, just to kind of keep track of who has produced
4 what and who is left on the sidelines, who needs a sponsor or
5 something. Okay?

6 MR. NADOLENCO: Perfectly acceptable. Thank you, Your
7 Honor.

8 THE COURT: Okay.

9 MR. NADOLENCO: With that we would like to call our
10 first witness, Steven Douglas, to the stand.

11 STEVEN DOUGLAS, Sworn

12 COURTROOM CLERK: Please be seated and state your full
13 name and please spell your last name.

14 THE WITNESS: Steven Paul Douglas, D-o-u-g-l-a-s.

15 THE COURT: And Mr. Douglas, you did submit a revised
16 affidavit here, and it was submitted under oath, but the
17 documents are going to be put in front of you and I guess --
18 I'm not sure who is going to be doing the cross-examination.

19 MS. KOBICK: I will, Your Honor. Your Honor may I
20 approach?

21 THE COURT: Yes.

22 In that connection, Ms. Beatty, if I may, Ms. Kobick,
23 Ms. Beatty just wants to be assured that everybody in the
24 courtroom is someone who is subject to the confidentiality
25 understandings because, if they're not, they'll have to leave

1 the courtroom whenever we turn it off. Okay. So I look to you
2 to police that because I'm not familiar with the people who are
3 here.

4 MR. NADOLENCO: Absolutely, Your Honor.

5 THE COURT: You may proceed.

6 MS. KOBICK: Great.

7 CROSS-EXAMINATION BY MS. KOBICK:

8 Q. Good morning, Mr. Douglas. My name is Julia Kobick, and I
9 represent the Attorney General in this case.

10 You're a member of the board of the National Automotive
11 Service Task Force; is that correct?

12 A. That's correct.

13 Q. And we can use the acronym NASTF for short; is that right?

14 A. Yes.

15 Q. Thank you. You've been a member of the board of NASTF
16 since it was founded; is that right?

17 A. That's correct.

18 Q. Now, NASTF is an independent organization that facilitates
19 dialogue between the auto industry aftermarket and car
20 manufacturers; is that right?

21 A. That's correct.

22 Q. And we can use the acronym OEMs for car manufacturers,
23 correct?

24 A. Yes.

25 Q. Thank you. Now, the member of the NASTF's board include

1 representatives from car manufacturers, repair shops, car
2 dealers, locksmiths, technicians and others involved in the
3 auto industry; is that right?

4 A. That's correct.

5 Q. And NASTF provides a platform for car manufacturers in the
6 aftermarket in the auto industry as a whole to engage in a
7 collaborative dialogue; is that right?

8 A. That's correct, yes.

9 Q. Now, Mr. Douglas, in your affidavit you discuss NASTF's
10 secure data release model; is that right?

11 A. Yes, I did.

12 Q. And you're familiar with the acronym, SDRM, for secure
13 data release model?

14 A. I am, very.

15 Q. Okay. Now, the SDRM program is administered by NASTF via
16 the Vehicle Security Professional's website; is that right?

17 A. That's correct, yes.

18 Q. Okay. And that SDRM program was developed in a
19 cooperative fashion by car manufacturers, repair shops,
20 locksmiths, and car dealers; is that right?

21 A. That's correct.

22 Q. And NASTF started work on that program around 2003; is
23 that correct?

24 A. That's correct, yes.

25 Q. Okay. But then it accelerated its work around 2008 in

1 response to a law that was enacted in California; is that
2 right?

3 A. Yes, the program was -- SDRM was actually launched in
4 2008.

5 Q. And it accelerated -- and NASTF accelerated the
6 development of that program in response to this California law;
7 is that right?

8 A. Well, the California law was adopted in 2006, to my
9 knowledge.

10 Q. Okay. But is it correct that NASTF sort of accelerated
11 the development of the program in response to that law?

12 A. I mean, we had been working with -- the Association of
13 Locksmiths of America had come to -- we have two meetings each
14 year, and the Associated Locksmiths of America had come in
15 March of 2003 to say, you know, We'd like to do this. So
16 that's when we kind of started working on it, and then the law
17 was passed in 2006.

18 Q. Okay. I'll just ask again. Would you say that NASTF
19 accelerated its work in the program in response to the
20 California law?

21 A. Yes. I mean, there was certainly a sense of urgency.

22 Q. Thank you. Now, Mr. Douglas the purpose of the SDRM
23 program is to provide a platform for manufacturers to securely
24 share vehicle data like key codes or immobilizer codes with
25 locksmiths and repair shops who have been vetted and are

1 legitimate businesses; is that right?

2 A. Yes. The purpose of the SDRM is to verify that a
3 locksmith is a bona fide locksmith, that they have met the
4 criteria of the locksmith, that they have a business license,
5 that they have appropriate insurance bonding, things like that.
6 So that an OEM can be confident that yes, this is --

7 Q. Okay. So any locksmith or repair technician that wants to
8 participate in the SDRM, for example, they want to be able to
9 cut new keys, they have to register with the Vehicle Security
10 Professional's website, correct?

11 A. That's correct.

12 Q. And you were just saying some of this, but they'd have to
13 show that they have a business license in the state that
14 they're in; is that right?

15 A. That's correct. Assuming that that state requires a
16 business license. Some states do not.

17 Q. Okay. And they'd also have to submit proof that they're
18 insured, correct?

19 A. That's correct.

20 Q. And they'd have to undergo a --

21 THE COURT: May I just interrupt. What happens in the
22 states that don't have qualifications for locksmiths?

23 THE WITNESS: What they do is they verify, to the
24 extent that they can, that we can, that the locksmith has a
25 business, a permanent business address and they're not

1 operating out of an apartment or house or vacant lot, which we
2 have seen things like that.

3 THE COURT: All right. Sorry to interrupt. Go ahead.

4 Q. Someone would also have to undergo a background check by
5 NASTF; is that right?

6 A. That's correct.

7 Q. Now, car manufacturers are not involved in registering a
8 vehicle security professional on the VSP website; is that
9 right?

10 A. That's correct.

11 Q. And they're not involved in the background check process
12 either?

13 A. That's correct.

14 Q. And they're not involved in verifying a vehicle security
15 professional's business license or insurance either; is that
16 right?

17 A. I mean, to the extent that OEMs are involved in NASTF and
18 they were involved in setting up the program, then they are
19 involved in that, in insuring that, you know, we've identified
20 the correct criteria that would give an OEM confidence that
21 they are providing the vehicle security information to.

22 Q. But an OEM wouldn't actually look at a vehicle security
23 professional's business license before they're registered with
24 the program, correct?

25 A. No, that's correct.

1 Q. NASTF digitally stores the records of the vehicle security
2 professional's license; is that right?

3 A. Yes.

4 Q. And NASTF also digitally stores a record of the insurance?

5 A. That's correct, to my knowledge.

6 Q. And also NASTF digitally stores the record of the
7 background check; is that right?

8 A. That's correct, again to my knowledge.

9 Q. Sure, thank you.

10 Now, before a vehicle security professional can access
11 data like key code or an immobilizer code, they'd have to
12 verify that the person requesting the code is the owner of the
13 vehicle; is that right?

14 A. I'm sorry. Could you repeat that question.

15 Q. Sure, sure.

16 Once someone's registered with the SDRM program, before
17 they can access data like a key code or an immobilizer code,
18 they'd have to first verify that the car owner is requesting
19 that the key be made; is that right?

20 A. Right, that's correct.

21 Q. Okay. And then a digital record of that verification is
22 also created, right?

23 A. That is correct, yes.

24 Q. Okay. And then NASTF also stores a digital record of that
25 verification as well, correct?

1 A. That's correct, and the authorization of course. So if I
2 wanted your key, they would verify that, and you would sign
3 saying yes, I'm requesting that information.

4 Q. Thank you. And so the car manufacturer is interfaced with
5 the SDRM program; is that correct?

6 A. Their interface is to verify that the locksmith is a valid
7 active locksmith with proper credentials.

8 Q. NASTF does that process, right?

9 A. Yes, but an OEM. So a locksmith would go to the OEM's
10 website, and then the OEM's website would query the SDRM to
11 say, Is this person a valid locksmith with proper credentials?

12 Q. But the OEM is not part of the verification process
13 initially, correct?

14 A. That's correct.

15 Q. Okay. All right.

16 Now, Mr. Douglas, aside from your work onboard at NASTF,
17 you're also a vice president at the Alliance for Automotive
18 Innovation; is that right?

19 A. That's correct.

20 Q. Before that, you worked for the Alliance of Automobile
21 Manufacturers?

22 A. That's correct.

23 Q. And you testified in your affidavit how, when you worked
24 for the Alliance of Automobile Manufacturers, you were involved
25 in drafting a letter in 2002 to then Senator Byron Dorgan; is

1 that right?

2 A. That's correct.

3 Q. And Mr. Douglas, that letter is Trial Exhibit 69. It's
4 the fourth tab of your binder. Would you turn to it, please.

5 MS. KOBICK: And Your Honor, should we mark the binder
6 for identification?

7 THE COURT: I don't think that's necessary.

8 MS. KOBICK: Okay, thank you.

9 THE COURT: The documents that are in it are
10 independently introduced.

11 MS. KOBICK: All right. Okay.

12 Q. Mr. Douglas, in the letter the car manufacturer is
13 committed to make available emission and non-emission related
14 service information, training information, and diagnostic tools
15 in the same manner and to the same extent as specified by the
16 California Air Resources Board, CARB, regulations for emission
17 related systems and components. Did I read that correctly?

18 A. Yes, I believe you did.

19 Q. Thank you. And the car manufacturer is committed to doing
20 this by August 31, 2003, correct?

21 A. That's correct.

22 Q. Now, the letter is dated September 20, 2002; is that
23 right?

24 A. That's correct.

25 Q. Okay. So that August 31, 2003 deadline is less than a

1 year after the date that the letter was sent; isn't that right?

2 A. That's correct.

3 Q. So the car manufacturer is committed to doing this in
4 under a year, right?

5 A. Well, I think -- yes, I mean, the letter is less than one
6 year, but keep in mind that the regulations that are specified,
7 CARB regulations for emission related, that was already in the
8 books and had been for, I don't know, six months, eight months.

9 Q. But the commitment that was specifically identified in the
10 letter, the manufacturer's committed to doing it under a year?

11 A. Yes, the letter is dated September of 2002, and the
12 commitment was filed August of 2003.

13 Q. Thank you.

14 Now, this letter does not mention how this commitment by
15 the car manufacturers would be enforced, does it?

16 A. No, it does not.

17 Q. It doesn't mention any enforcement mechanism at all?

18 A. No.

19 Q. No. Okay.

20 The letter does state that successful implementation of
21 this commitment by car manufacturers will eliminate the need
22 for future state and federal legislation. Did I read that
23 correctly?

24 A. That's correct.

25 Q. Okay. And then, Mr. Douglas, if you'll turn to the last

1 page of the exhibit, I think that's page -- it would be the
2 22nd page, that's a letter of support from Volvo; is that
3 correct?

4 A. That's correct.

5 Q. Okay. And now the second paragraph of that letter says,
6 "We believe that this commitment to cooperation instead of
7 legislative initiatives will better serve our interests and the
8 interests of all whom require the information and material."
9 Did I read that correctly?

10 A. You did.

11 Q. Okay. So one of the goals of sending this letter was to
12 stave off legislation by Congress and the states; is that
13 right?

14 A. Well, I think the purpose of the letter was to provide our
15 commitment to provide both emission related as well as
16 non-emission related and that was kind of the expansion of --

17 THE COURT: Mr. Douglas, you'll answer the question.
18 The question is, was one of the goals to stave off additional
19 legislative initiatives?

20 THE WITNESS: Yes.

21 THE COURT: Okay. Next question.

22 MS. KOBICK: Thank you.

23 Q. Now, part of your work at the Alliance For Automotive
24 Innovation involves issues related to Clean Air Act
25 regulations; is that right?

1 A. Correct.

2 Q. And you've worked over your career with the California Air
3 Resources Board or CARB for short?

4 A. Correct.

5 Q. Yes. And now the California Air Resources Board sets
6 vehicle emission standards for California and states that have
7 adopted California's regulations; is that right?

8 A. Correct.

9 Q. Now, California initially adopted a different approach
10 than other states in how it regulated vehicle emissions; is
11 that correct?

12 A. That's -- I guess I'm not exactly sure what you mean by a
13 different method.

14 Q. Well, the Clean Air Act recognizes California's sort of
15 unique status because it grants it an exemption from federal
16 preemption that allows the state to adopt more stringent
17 regulations than those provided by federal law; is that right?

18 A. That's correct.

19 Q. Okay. And I believe you've written about this in your
20 affidavit, but that exemption is codified at 42 U.S.C. Section
21 7543(b), right?

22 A. That's correct.

23 Q. And it says that any state that has adopted standards of
24 control for emissions -- sorry -- for control of emissions from
25 new cars or new car engines before March 30, 1966 can adopt

1 emissions regulations that are more stringent than the federal
2 regulations, right?

3 A. That's correct.

4 Q. Okay. And, in fact, California had adopted emissions
5 standards before March 30, 1966, right?

6 A. That's correct.

7 Q. And California had launched its emission control program
8 in 1964 with adoption of standards applicable to model year
9 1966 vehicles, correct?

10 A. That's correct.

11 Q. Okay. And no other state besides California had adopted
12 emissions standards for new motor vehicles before March 30,
13 1966, right?

14 A. To my knowledge. That was before my time.

15 Q. Thank you.

16 Now, to facilitate compliance with the EPA emissions
17 standards, the EPA requires that cars use an onboard diagnostic
18 system or OBD for short, correct?

19 A. That's correct.

20 Q. And now, OBD software in part monitors the parts of the
21 car that would permit emissions to increase, right?

22 A. That's correct.

23 Q. And a repair technician could access the OBD system on a
24 car through the car's OBD port, right?

25 A. That's correct.

1 Q. Another name for the OBD port would be the J1962 port or
2 J1962 connector?

3 A. That's correct.

4 Q. Okay. Thank you.

5 And that OBD port has been standardized across all motor
6 vehicles since 1962; is that right?

7 A. No, not since 1962. That was -- it's probably been
8 standardized -- I'm not exactly sure of the year, but OBD-II
9 didn't come around until about 1996.

10 Q. So all cars manufactured today currently have a
11 standardized OBD port, correct?

12 A. That's correct.

13 Q. Okay. And any repair technician could plug a diagnostic
14 scan tool into this standardized OBD port, correct?

15 A. That's correct.

16 Q. So if a repair technician were to plug a scan tool into
17 the OBD port, they could receive codes that would identify any
18 potential malfunctions in the vehicle; is that right?

19 A. That's correct.

20 Q. Now, you've testified, Mr. Douglas, in paragraph 34 of
21 your affidavit, which is at the first tab of the binder -- I'll
22 give you a minute to turn to that.

23 A. Okay.

24 Q. All right. So you've testified in the first sentence that
25 there are many ways to tamper with vehicle emissions controls,

1 and then moving to the third sentence, you testified that an
2 individual could use the OBD port to reprogram the vehicle and
3 change the vehicle calibration in a way that increases the
4 vehicle's emissions. Did I read that correctly?

5 A. That's correct.

6 Q. But tampering with the onboard diagnostic system is not an
7 issue that you dealt with when you were working at the Alliance
8 of Automobile Manufacturers; is that right?

9 MR. LINDER: Objection. Foundation.

10 THE COURT: Well, she's going to find out. What's the
11 answer? Did you work on it or not?

12 THE WITNESS: I did work on --

13 THE COURT: Okay. Next question. I want to do this
14 by question and answer. So I want you to be responsive, and I
15 want her to be able to more precisely state her question as she
16 follows up.

17 Q. You recall sitting for a deposition in this case on April
18 22, 2021; is that right?

19 A. That's correct.

20 Q. And you remember a court reporter was present?

21 A. Yes.

22 Q. And you swore to tell the truth in that deposition and, in
23 fact, you did tell the truth; is that right?

24 A. That's correct.

25 Q. Okay. Would you turn to tab 2 of your binder, the

1 deposition transcript, and if you turn to page 59.

2 A. Okay.

3 Q. At lines 5 to 7 you were asked, "Is tampering with the
4 onboard diagnostic system an issue that you dealt with in your
5 role at the Alliance of Automobile Manufacturers?" And then at
6 lines 15 to 17 you replied, "I don't specifically recall
7 dealing with tampering with the OBD system at the Alliance of
8 Automobile Manufacturers." Did I read that correctly?

9 A. Yes, you did.

10 Q. Thank you. Now, tampering with the onboard diagnostic
11 system is not something that you've dealt with in your current
12 role at the Alliance For Automotive Innovation; is that right?

13 A. That's correct.

14 Q. Okay. And you don't have any familiarity with the
15 measures that are used by car manufacturers to prevent
16 tampering through the OBD port; is that right?

17 A. No. That's correct.

18 Q. Okay. Now, Mr. Douglas, you've also testified in your
19 affidavit about Massachusetts' 2013 Right to Repair law; is
20 that right?

21 A. That's correct.

22 Q. And in paragraph 11 of your affidavit you testified --
23 well, I'll let you turn to paragraph 11 at tab 1.

24 A. Okay.

25 Q. All right. So in paragraph 11, you testified that the

1 requirements of that 2013 law did not implicate cybersecurity
2 concerns; is that right?

3 A. That's correct.

4 Q. But you don't work on cybersecurity issues in your current
5 role for the Alliance for Automotive Innovation?

6 A. That's correct.

7 Q. And you didn't work on cybersecurity issues during your
8 time at the Alliance for Automobile Manufacturers; is that
9 right?

10 A. That's correct.

11 Q. You're not familiar, for example, with NHTSA's guidance
12 document titled Cybersecurity Best Practices for Motor
13 Vehicles?

14 A. No, I am not.

15 Q. And your work at the Alliance for Automotive Innovation
16 has not involved responding to NHTSA on vehicle cybersecurity
17 issues either, right?

18 A. No, that's correct.

19 MS. KOBICK: No further questions, Mr. Douglas. Thank
20 you.

21 THE COURT: All right. Redirect?

22 MR. LINDER: Thank you, Your Honor.

23 DIRECT EXAMINATION BY MR. LINDER:

24 Q. Good morning, Mr. Douglas.

25 A. Good morning.

1 Q. You testified in your affidavit and on cross-examination
2 about SDRM. How does it work?

3 A. The SDRM, what it does is it verifies the credentials of a
4 locksmith. So how it works is if you lost your keys to your
5 car, you would go to a locksmith, and you would say, "I need
6 the keys for my Toyota car." The locksmith would then go to
7 the Toyota web -- they would verify that you were the owner of
8 the vehicle, and they would they would go to the Toyota
9 website. And they would put in their information, and they
10 would put in their SDRM credentials. Toyota's website would
11 then -- and they would put in your vehicle identification
12 number for the vehicle.

13 Toyota's website would then query the SDRM and say, "Is
14 this locksmith valid?" And the SDRM would return either a yes
15 or a no. Yes, they are valid, they're active in the system,
16 they have their background check, they have their insurance
17 license, things like that, or no, they're not. If the answer
18 comes back yes, the Toyota website could proceed with providing
19 the locksmith the information.

20 The SDRM would also record the information about the
21 transaction. So it would say, this locksmith on this day and
22 time requested a key code information for this, and it would
23 store that transaction. That information would also go to the
24 National Insurance Crime Bureau.

25 So that's kind of the process that SDRM goes through in

1 issuing a key code. And the same is true for other vehicle
2 security information like immobilizer reset.

3 Q. Okay. Does SDRM transfer or keep any OEM data at any
4 point?

5 A. Such as?

6 Q. Like the immobilizer code or the key code. Do they hold
7 any of the OEM's data?

8 A. No. We could not. I mean, that would be, you know, 280
9 million vehicles on the road and another --

10 THE COURT: Well, I realize you want to explain more,
11 but just answer the question, and I guess the answer is no.

12 THE WITNESS: No.

13 THE COURT: Okay. So we'll skip the 280 million.

14 Q. Why don't you --

15 A. I mean, you would be putting the vehicle security
16 information for 280 million vehicles, plus another 15 to 20
17 million vehicles each year, into a central location, and that
18 would presumably become the focus point for every hacker, every
19 ransomware hacker, every vehicle thief, and every crime
20 syndicate in the world. And there's just no possible way that
21 NASTF could maintain that kind of security or that kind of
22 data. I mean, we have enough trouble just maintaining the data
23 for a few thousand locksmiths and independent repair shops.

24 Q. You mention trouble. What kind of trouble have you had?

25 A. Well, so as was discussed in 2008, we launched the SDRM

1 after, I don't know, five or six years of development. And
2 then as it gained momentum, we had more transactions, so we
3 were up to about a million a year in 2015.

4 And then we found some problems with security of the SDRM,
5 and we took those very seriously. So we came out with a
6 revised SDRM which we termed SDRM 2.0, and that did things like
7 increase the security of the passwords. It notified locksmiths
8 so if their credentials had been used, it would notify the
9 locksmith that their credentials had been used, because we
10 found that in the prior version they did not. So it did things
11 like that.

12 We also implemented software algorithms that would flag
13 suspicious transactions like if you had been getting -- and
14 this was the case -- you had been getting, you know, three,
15 four key codes per month and all of a sudden you started
16 getting 50 to 100 per day, so that kind of automation.

17 It also flagged things like you're a locksmith in
18 Massachusetts but you've started cutting a lot of keys for
19 vehicles in Oklahoma or Arkansas or Texas. So it would flag
20 that -- it's not to say there's anything wrong, but it would
21 flag it for follow up. So those kinds of problems that we
22 sought to avoid.

23 Q. In what year did SDRM 2.0 launch?

24 A. We launched that in 2018. So we identified the issues in
25 2016, and then over the next couple of years we developed, we

1 hired a new firm to develop software. We hired a new kind of
2 sheriff to oversee the SDRM to kind of monitor the security of
3 that program, and then in 2018 we launched it.

4 Q. And since you've launched it in 2018 have there been any
5 further security problems with SDRM 2.0?

6 A. There have been. We have had instances where like a
7 locksmith will, for lack of a better term, lend his credentials
8 to another locksmith or to another person, maybe not even a
9 bona fide locksmith. So we have found that. And just in
10 general, I mean it's a constant, it's a constant vigilance that
11 you have to maintain because this is important.

12 MR. LINDER: Your Honor, may I approach the witness
13 with his witness binder?

14 THE COURT: Yes. In the future, I think if that can
15 just be put up on the bench before, but go ahead.

16 MR. LINDER: Absolutely, Your Honor. I planned to and
17 failed to. I apologize.

18 Your Honor, if I may, I'd like to move into evidence
19 Exhibits 1, 4, 14 and 69.

20 THE COURT: They are in evidence because of the
21 introduction of the declaration. So they were already in
22 evidence effectively through direct testimony.

23 MR. LINDER. Okay. So we don't have to readmit them
24 with each witness on the stand. They're sort of coming along.

25 THE COURT: Yes, that's the protocol, yeah.

1 MR. LINDER: Thank you very much.

2 THE COURT: And this may be the second copy of that
3 document. That is, did you have your declaration in front of
4 you before?

5 THE WITNESS: I did, Your Honor.

6 THE COURT: Okay.

7 THE WITNESS: This one is just full pages where the
8 other one was shrunk down.

9 MR. LINDER: Your Honor, he had the cross binder and
10 this is the --

11 THE COURT: Okay. Go ahead.

12 MR. LINDER: Thank you.

13 Q. You testified both in your affidavit and on cross-
14 examination about the Right to Repair movement. Do you recall
15 that?

16 A. I do.

17 Q. When did you first become involved in the Right to Repair
18 movement?

19 A. In 1999.

20 Q. And what was your involvement?

21 A. There was legislation in Arizona and a month or so later
22 in California on the Right to Repair.

23 Q. And what was your involvement?

24 A. So what we did, when the Arizona law was passed we were a
25 little bit surprised by it, and we genuinely -- "we" being the

1 automakers -- genuinely believed we were providing all the
2 information necessary to diagnose and repair vehicles. And so
3 we met with the aftermarket, and they genuinely believed that
4 we were withholding information from them.

5 And so we started meeting regularly, and it turns out
6 there was a little truth in both sides of that story. So we
7 started meeting regularly to try to resolve the issues and
8 identify what the problems were. So that was in Arizona.

9 In California, we met with the author of the legislation
10 and with the other side, with the aftermarket, and we started
11 meeting. The Arizona law, we continued meeting with the
12 aftermarket. The law never went anywhere, but in California we
13 negotiated the law and amended the bill a number of times with
14 the other side, and over the next, I don't know, year, year and
15 a half, we developed the Right to Repair Law.

16 So in late 2000, that law was adopted. We, of course,
17 dropped our opposition by that point and we had reached an
18 agreement with the other side.

19 And then over the next, I guess, year to a year and a
20 half, we worked with the other side with the California Air
21 Resources Board to actually develop regulations to implement
22 the Right to Repair law in California. So those were adopted,
23 and the regulations were adopted in 2002.

24 And then, of course, shortly thereafter in late 2002 we
25 signed the Dorgan -- so all of that in California was emission

1 related, and then in late 2002 signed the Dorgan letter, which
2 expanded the emission related to non-emission related because
3 the aftermarket had rightly said, Hey, you know, emission
4 related, that's fine. That deals with catalytic converters and
5 engines and things like that, but what about non-emission
6 related like the air conditioning system, the brakes? And so
7 the Dorgan letter expanded the non-emission related.

8 So, I mean, I think what we've done is -- and to my
9 knowledge, that worked, the Dorgan letter worked and, you know,
10 it was always our intent to provide the information necessary
11 to repair the vehicles.

12 MS. KOBICK: Your Honor, I move to exclude that as
13 outside the scope of the cross-examination.

14 THE COURT: Well, it's in the penumbra but pretty
15 light. So perhaps you won't be exploring that much more on
16 this, given the limited time that you have.

17 MR. LINDER: I appreciate that, Your Honor, and I had
18 not planned to.

19 THE COURT: All right.

20 Q. The next chapter on the Right to Repair law, which I'd
21 like to focus your attention to the 2013 chapter. What
22 happened then?

23 A. In 2013 -- actually, it was in 2012 we worked with --
24 again, there was legislation and we worked with the aftermarket
25 to develop an agreement on legislation. And what the 2013

1 Massachusetts Right to Repair law did was it kind of codified
2 the Dorgan letter, and then it also expanded it to require the
3 vehicle's design to allow diagnosis and repair using an SAE
4 J2534 device.

5 Q. How long did it give manufacturers to make automobiles
6 capable of using that device?

7 A. The original bill was adopted in 2012, and it allowed --
8 and then a follow on, the 2013 Massachusetts Right to Repair
9 law, which was the same, but it allowed until 2018 model years.
10 So four, five years to do that.

11 I would say that we kind of had a running start because
12 2534 had been around for --

13 THE COURT: That's sufficient. Next question.

14 MR. LINDER: Thank you, Your Honor.

15 Q. The 2014 MOU, if you could please turn to Exhibit 1 in
16 your binder.

17 MS. KOBICK: Objection, Your Honor. Again, this is
18 outside the scope of the cross.

19 MR. LINDER: The cross covered, Your Honor, the full
20 right to repair --

21 THE COURT: I'll permit it, understanding that the
22 clock is running.

23 MR. LINDER: Yes, Your Honor. Thank you.

24 Q. Very briefly, Mr. Douglas, what is the 2014 MOU?

25 A. The 2014 MOU simply expands the 2013 Massachusetts law to

1 all 50 states.

2 Q. And if I could direct your attention, please, in the Right
3 to Repair agreement itself to paragraph section 6 which is on
4 Bates number page 2641. It's actually the last page of tab 1.

5 A. Sorry. Could you repeat the location.

6 Q. Sure. It's section 6 of the Right to Repair agreement
7 that's attached to the MOU. It's page 2641. It should be the
8 last page of what's in tab 1. Do you see that?

9 A. That's correct, I do.

10 Q. What is that provision?

11 A. That's a -- if the aftermarket, if an independent
12 technician believes that manufacturers are not complying with
13 the MOU, then this allows them to file a complaint with the
14 dispute resolution panel.

15 Q. In the approximately seven years since the MOU was signed,
16 has there ever been a dispute resolution procedure initiated by
17 an aftermarket member?

18 A. No.

19 MR. LINDER: No further questions, Your Honor.

20 THE COURT: All right. Thank you. You may step down.

21 THE WITNESS: Thank you.

22 THE COURT: So I guess we have Mr. Baltes.

23 MR. NADOLENCO: Your Honor, let me first check,
24 please, if Mr. Tierney might be here.

25 THE COURT: Okay.

1 MR. NADOLENCO: Perfect timing, Your Honor. Plaintiff
2 calls Kevin Tierney to the stand.

3 THE COURT: So if we can have you on the bench, the
4 witness box over there, Mr. Tierney. If we can put the various
5 binders in front of Mr. Tierney at this point.

6 KEVIN TIERNEY, Sworn

7 COURTROOM CLERK: Please be seated and state your full
8 name and please spell your last name.

9 THE WITNESS: Kevin Howard Tierney, T-i-e-r-n-e-y.

10 MS. FISCHER-GROBAN: Your Honor, may I approach?

11 THE COURT: Yes. All right. So we are offering
12 the --

13 MR. NADOLENCO: Yes, Your Honor. We'd move the
14 admission of his affidavit and the associated exhibits.

15 THE COURT: All right. They're received.

16 MS. FISCHER-GROBAN: Your Honor, I just wish before we
17 begin to preserve our objections to the exhibits that are being
18 introduced.

19 THE COURT: Yes, they are received on that basis.
20 Similarly, with respect to -- I can't recall if there's
21 anything with Mr. Douglas, but the discussions that we have had
22 before have shaped my rulings with respect to that. Of course,
23 those rulings are without prejudice, them being raised if there
24 is some further foundation for them.

25 MS. FISCHER-GROBAN: Thank you, Your Honor.

1 And similarly, I wish to preserve our objection to the
2 portions of Mr. Tierney's affidavit that we objected to in our
3 motion in limine.

4 THE COURT: Yes. I understand that objection to both
5 the declaration or affidavit and the exhibits.

6 MS. FISCHER-GROBAN: Thank you, Your Honor.

7 THE COURT: Okay.

8 MR. NADOLENCO: Your Honor, I obviously don't know
9 where the cross will start, but to the extent we're having
10 confidentiality issues, I want to address those before we
11 begin.

12 THE COURT: Sure. I understood that that would be at
13 the tail end of what you're doing.

14 MS. FISCHER-GROBAN: I am so glad Mr. Nadolenco raised
15 this. Unfortunately, this particular cross-examination is
16 interspersed with confidential information. So I do think this
17 is one where we will have to have the entire proceeding be
18 confidential.

19 THE COURT: So we'll do that with the understanding to
20 the degree that we can unscramble the egg later. We'll try to
21 do so by going through the transcript.

22 MR. NADOLENCO: Absolutely.

23 THE COURT: But I'll instruct Ms. Beatty to close the
24 hearing at this point, and if there's anyone in the courtroom
25 who is not subject to the protective orders here, they should

1 leave at this point.

2 * * * C O N F I D E N T I A L * * *

3 MR. NADOLENCO: Highly confidential or just
4 confidential?

5 MS. FISCHER-GROBAN: No, it's not highly confidential.

6 MR. NADOLENCO: Is there anyone in the courtroom who
7 isn't subject to the protective order, any press, reporters? I
8 don't recognize some of the people. Going once, going twice.
9 Gone.

10 THE COURT: Honor system but, of course, not to put
11 too fine a point on it, if there is somebody who has not fairly
12 responded, then they're subject to contempt of court. So it's
13 time to leave if there's some question.

14 MR. NADOLENCO: Your Honor, just give me one moment.

15 (Pause.)

16 MR. NADOLENCO: Sorry, Your Honor.

17 THE COURT: You may proceed.

18 MS. FISCHER-GROBAN: Thank you, Your Honor.

19 CROSS-EXAMINATION BY MS. FISCHER-GROBAN:

20 Q. Good morning, Mr. Tierney. It's nice to see you again.
21 I'll introduce myself again. My name is Phoebe Fischer-Groban
22 and I represent the Attorney General in this case.

23 THE COURT: Ms. Fischer-Groban, if you could move the
24 microphone up a little bit to project.

25 MS. FISCHER-GROBAN: Is this better?

1 THE COURT: It is for me.

2 MS. FISCHER-GROBAN: I'm going to move it closer --
3 oh, I can hear myself even better now. Okay.

4 Q. Mr. Tierney, you started at GM in 2003; is that correct?

5 A. Originally, correct.

6 Q. And you've worked at GM for 15 years, right?

7 A. I think a little bit more in total, but close.

8 Q. A little more than 15 years, right?

9 A. Yes.

10 Q. And you had a brief stint at John Deere, correct?

11 A. That's correct.

12 Q. It was about two years, right?

13 A. That's correct.

14 Q. And John Deere doesn't make passenger cars; is that
15 correct?

16 A. That's correct.

17 Q. And then after your stint at John Deere, you returned to
18 GM; is that right?

19 A. That is correct.

20 Q. And you've never worked at another automobile
21 manufacturer, correct?

22 A. Not another automobile manufacturer, correct.

23 Q. And today you're the vice president of global
24 cybersecurity at GM, right?

25 A. That is correct.

1 Q. And vice president, that's a senior leadership position;
2 is that correct?

3 A. That is correct.

4 Q. Cybersecurity is a top corporate priority at GM; is that
5 correct?

6 A. It is.

7 Q. And you'd agree that GM is receptive to agency guidance
8 and cybersecurity?

9 A. We are.

10 Q. But GM is a proponent of flexible guidance by federal
11 regulatory agencies like NHTSA; isn't that correct?

12 A. In the case of cybersecurity, it's generally best practice
13 to be flexible because the threat evolves quickly.

14 Q. So it's GM's position that flexibility is very important
15 in the area of regulatory guidance for cybersecurity, right?

16 A. Flexibility is a key part, yes.

17 Q. As opposed to strict rules, correct?

18 A. There can really be two parts of it. There can be strict
19 rules, but flexibility has to be a key part of those rules.

20 Q. Mr. Tierney, I'm going to ask you to please answer my
21 questions.

22 THE COURT: I think he has. And let me just outline
23 this for those who follow. I'm not going to entertain fencing
24 or playing with words or using strict construction perhaps as
25 opposed to latitudinarian instruction when you're asking a

1 witness. Ask him specific questions about specific things. I
2 want to think things, not words. That's what I'm trying to do
3 in this hearing. Okay?

4 MS. FISCHER-GROBAN: Yes, Your Honor, understood.

5 Q. That's, as you described before, it's part because in your
6 view cybersecurity is an evolving art. Do you agree with that?

7 A. It is.

8 Q. And it changes quickly, right?

9 A. It does.

10 Q. And flexibility in federal rules allows manufacturers like
11 GM, where you work, to adapt to evolving developments in
12 cybersecurity, right?

13 A. Yes, generally, I agree.

14 Q. So in 2016 NHTSA issued proposed cybersecurity guidance;
15 is that correct?

16 A. That's correct.

17 Q. And GM submitted a comment to NHTSA on its cybersecurity
18 guidance, right?

19 A. Correct.

20 Q. And you reviewed that comment before it was submitted,
21 yes?

22 A. I did.

23 Q. And if you'd look in your binder at tab 502, there's a
24 document that's been marked as Exhibit 502.

25 THE COURT: This is the cross-examination binder.

1 MS. FISCHER-GROBAN: That's correct, Your Honor.

2 Q. Mr. Tierney, do you recognize this document at tab 502,
3 whenever you get there?

4 A. I do.

5 Q. What is this document?

6 A. I believe these were formal comments to NHTSA on our
7 behalf regarding their guidance.

8 MS. FISCHER-GROBAN: Your Honor, I move to enter
9 Exhibit 502 in evidence. This is one we're introducing through
10 Mr. Tierney.

11 THE COURT: Yes, it's received.

12 Q. And you, Mr. Tierney, you agree with the content of this
13 comment that GM submitted to NHTSA, correct?

14 MR. NADOLENCO: Objection. That's compound.

15 THE COURT: Well, I'll permit it.

16 THE WITNESS: Keep going? I'm sorry.

17 THE COURT: Do you agree with the content? Do you
18 agree with the content of this?

19 MR. NADOLENCO: Your Honor, can we give him a second
20 to read the multiple-page letter?

21 THE COURT: Right, although I'd be surprised if it's a
22 surprise to him.

23 A. I do agree with the content.

24 Q. And if you look at the first paragraph of this letter,
25 this comment under Introduction and Background, GM told NHTSA

1 that its cybersecurity best practice's guidance, quote,
2 "exemplifies a flexible approach to automotive cybersecurity."

3 Correct?

4 A. Yes.

5 Q. It's not overly specific, right?

6 A. I don't know that he used the words "overly specific."

7 Q. But you'd agree that a flexible approach isn't overly
8 specific, correct?

9 A. There can be specifics in a flexible approach.

10 MS. FISCHER-GROBAN: Your Honor, if I may turn --

11 Q. Mr. Tierney, you recall that I took your deposition in
12 April of this year. Do you remember?

13 A. Yes.

14 Q. And at that deposition you swore to tell the truth, the
15 whole truth and nothing but the truth, correct?

16 A. Correct.

17 Q. And you were telling the truth, correct?

18 A. Correct.

19 Q. So if you'd turn in your binder to page 246. Sorry, if
20 you'd turn to the deposition transcript at page 246, you'll
21 notice there are four pages per page.

22 A. Mm-hmm.

23 Q. And are you there?

24 A. Yes.

25 Q. Okay. So I asked you the question, "So I'm going to move

1 down to the Introduction and Background section on the first
2 page. This letter writes that GM believes that the best
3 practices document exemplifies a flexible approach to
4 automotive cybersecurity that will allow automakers to adapt to
5 the rapidly changing environment. In this context, how do you
6 understand 'flexible approach'? What do you understand that to
7 mean?" And your counsel interposed an objection. And you
8 said, "I guess the way that I would assume the characterization
9 is made in one in which the guidance is not overly specific
10 technically. It's when things are overly specific technically,
11 that's when you can get constrained in your potential solutions
12 and mitigations for cybersecurity threats." Did I read that
13 correctly?

14 A. Yes.

15 MS. FISCHER-GROBAN: Your Honor, is it your preference
16 that we would move to mark the transcript for identification.

17 THE COURT: No. The court reporter is taking that
18 down, although you should do it when you're reading from it
19 perhaps a little slower, although the court reporter has it.

20 But, again, I emphasize that I'm really interested in
21 specifics and not in this kind of throat-clearing, I guess is
22 the best way to describe these kinds of questions.

23 MS. FISCHER-GROBAN: Understood, Your Honor.

24 Q. And GM wrote in its comment to NHTSA that there's no
25 single binding solution or set of predefined requirements that

1 would be effective; is that correct?

2 A. I agree with that.

3 Q. And you agreed with that statement when GM submitted that
4 comment?

5 A. Correct.

6 Q. And afterwards NHTSA continued to keep its cybersecurity
7 guidance flexible and nonbinding, correct?

8 A. Flexible, correct.

9 Q. And as a result, today, there's no binding solution or set
10 of predefined federal requirements for cybersecurity, correct?

11 MR. NADOLENCO: Objection. I apologize. Objection to
12 the extent it calls for a legal conclusion.

13 THE COURT: No. He can answer this question as to his
14 understanding.

15 A. Can you restate the question. I apologize.

16 Q. Of course I'm happy to.

17 As a result today, there's no binding solution or set of
18 predefined federal requirements for cybersecurity; isn't that
19 correct?

20 A. There is no predefined solution, but I would argue that it
21 doesn't necessarily mean it's not binding.

22 Q. If you'll turn, please, to page 247 of your deposition
23 transcript that you have in your binder and let me know when
24 you get there, please.

25 A. Yes.

1 Q. So at the bottom at line 17, I asked you the question,
2 "So, you still agree that there's no single binding solution or
3 set of predefined requirements that would be effective." Your
4 counsel objected. You said, "I'm sorry" -- oh, and your
5 counsel said, "I'm sorry. In general, as to what?" And then
6 you said, "I think in general, yes, it's true." Did I read
7 that correctly?

8 A. Yes.

9 Q. Mr. Tierney, in paragraph 9 of your affidavit you
10 discussed that GM follows a very detailed and stringent product
11 development process; is that correct?

12 A. That's correct.

13 Q. And this process, as you say, includes adherence to GM's
14 policy of maintaining a secure development lifecycle, right?

15 A. Correct.

16 Q. And there are a lot of processes that product
17 cybersecurity follows; isn't that right?

18 A. Correct.

19 Q. And following a defined process is a core component of
20 GM's approach to cybersecurity, correct?

21 A. Correct.

22 Q. Switching gears a little bit, you're aware of the federal
23 motor vehicle safety standards generally, right?

24 A. I am.

25 Q. You don't know all of them, though, right?

1 A. I do not.

2 Q. And you don't know what they all require, correct?

3 A. No, I don't.

4 Q. But you know that they exist, right?

5 A. I do.

6 Q. And you know that GM works to comply with them, correct?

7 A. Yes.

8 Q. But that's the extent of your involvement with the motor
9 vehicle safety standards, correct?

10 A. I would disagree with that.

11 Q. Okay. If you'll open up your deposition transcript to
12 page 256. And I asked you the question, "What is your
13 awareness of the obligations that the Motor Vehicle Safety Act
14 imposes on GM?" Your counsel made an objection.

15 MR. NADOLENCO: I'm sorry. What line are you at?

16 MS. FISCHER-GROBAN: Of course. I'm starting at the
17 top of the page.

18 Q. And I ask the question, "What is your awareness of the
19 obligations that the Motor Vehicle Safety Act imposes on GM?"
20 And your counsel, Mr. Nadolenco, made an objection, and then
21 you responded, "I'm generally aware of them. I know there's a
22 number of federal motor vehicle standards out there. I don't
23 know them all. I don't know what they all require. But I know
24 that they exist and we work to comply, and that's about the
25 extent of my involvement in that."

1 MR. NADOLENCO: Your Honor, I don't think that's
2 proper impeachment, but it is what it is.

3 THE COURT: Right. And taken as it being what it is,
4 it's received.

5 MS. FISCHER-GROBAN: Thank you, Your Honor.

6 THE COURT: But again, you know, let's go for the
7 jugular rather than the capillaries.

8 MS. FISCHER-GROBAN: Okay. I have one more
9 question -- a couple more questions in this line and then I'll
10 move on.

11 Q. So your work doesn't involve motor vehicle safety standard
12 related tasks, correct?

13 A. Not directly.

14 Q. Right. And product cybersecurity doesn't certify vehicles
15 as compliant with the motor vehicle cybersecurity -- the motor
16 vehicle safety standards, correct?

17 A. Not directly.

18 Q. They don't certify -- the product cybersecurity doesn't
19 certify vehicles as compliant with the motor vehicle safety
20 standards, correct?

21 A. Our group does not directly certify, correct.

22 Q. Let's talk a little bit about your interactions with
23 representatives from the aftermarket. That was a term that
24 Mr. Douglas used. And you're familiar with that term,
25 correct --

1 A. Yes.

2 Q. -- about data access. So this was before the 2020 Data
3 Law was introduced. So you met with representatives from the
4 Auto Care Association, which is an aftermarket trade
5 association in January of 2019, correct?

6 A. I think that's correct.

7 Q. It was a meeting in Michigan?

8 A. Yes.

9 Q. Yes. And one of the subjects of that meeting was data
10 access, correct?

11 A. I believe so.

12 Q. And you're familiar with the Secure Vehicle Interface, or
13 SVI, right?

14 A. Yes.

15 Q. And you know that Secure Vehicle Interface, or SVI, is at
16 issue in this case, correct?

17 A. Yes.

18 Q. And it's one of the solutions that the Attorney General's
19 Office has proposed as a means to comply with the new law,
20 isn't that right?

21 MR. NADOLENCO: Objection just to the extent it lacks
22 foundation.

23 THE COURT: I'm sorry?

24 MR. NADOLENCO: Objection just to the extent it lacks
25 foundation.

1 THE COURT: Well, part of this is to find out whether
2 he does know that.

3 MR. NADOLENCO: Fair enough.

4 THE COURT: So I'm going to permit it.

5 MR. NADOLENCO: Fair enough.

6 THE COURT: Sir, you can answer the question.

7 A. I understand that SVI is part of the case, I understand.

8 Q. Thank you. And so at that meeting you had with the
9 representatives from 2019, the Auto Care Association folks
10 presented on the Secure Vehicle Interface at a high level,
11 right?

12 A. Yes, briefly, yes.

13 Q. And at that meeting you and the other participants
14 discussed having potentially another meeting to talk about SVI
15 in further technical detail, correct?

16 A. It was brought up briefly, yes.

17 Q. And a couple of weeks after the meeting, Aaron Lowe, who
18 works at the Auto Care Association, reached out to your
19 colleagues who were at the meeting to set up that other
20 meeting, isn't that right?

21 A. I wasn't directly aware of those conversations, no.

22 Q. Okay. And if you'll go to tab 505 of your binder, there's
23 a document marked Exhibit 5.

24 MS. FISCHER-GROBAN: Your Honor, this is an exhibit we
25 are introducing through Aaron Lowe, but I'd like to use it with

1 this witness at this time, if I may.

2 THE COURT: So we'll receive it at this time, since I
3 understand it's not objected to.

4 MS. FISCHER-GROBAN: Yes. Thank you, Your Honor.

5 Q. So this exhibit, at the bottom it's an email from Aaron
6 Lowe to Tim Turvey. And Tim Turvey is GM's global vice
7 president of customer care and aftersales; is that correct?

8 A. Previously was.

9 Q. Previously. Does he have a new title?

10 A. I believe he's retired.

11 Q. Okay. But at the time he was GM's global vice president
12 of customer care and aftersales, correct?

13 A. I believe that was his title, correct.

14 Q. At the bottom of the email you see that Aaron Lowe reached
15 out to set up a meeting. He said, "I would like to set up a
16 follow-up technical meeting to further discuss the Secure
17 Vehicle Interface and how it could help insure your GM vehicles
18 are cybersecure but still be able to allow access to critical
19 repair data for consumers in the independent auto care
20 industry." Did I read that correctly?

21 A. I believe so.

22 Q. And Mr. Turvey responded a couple of days later at the top
23 of the email, and he told Mr. Lowe that, "We're in the process
24 of developing our position on the areas of safety,
25 cybersecurity and consumer privacy. We continue to keep the GM

1 senior leadership team that you met fully engaged. We have had
2 discussions following our meeting and remain committed to
3 getting back with you as soon as possible." Did I read that
4 correctly?

5 A. Yes.

6 Q. So Mr. Turvey told Mr. Lowe that the senior leadership
7 team that he met with was fully engaged with the issue, right?
8 Is that what the email says?

9 A. It's what it says.

10 Q. And that senior leadership team that met with Mr. Lowe,
11 that includes you, correct?

12 A. I don't think at all times because I was not in my current
13 role at that time. And so I was not involved in all of those
14 conversations at that time.

15 Q. But you certainly were part of the team that met with
16 Mr. Lowe, correct?

17 A. I was in that meeting, correct.

18 Q. Yes. But Mr. Turvey in this email told Mr. Lowe that the
19 team was committed to getting back to Mr. Lowe and the Auto
20 Care Association folks as soon as possible. But you don't
21 recall any discussions with the team who was at the meeting
22 following the meeting with Auto Care about setting up a
23 follow-up meeting, correct?

24 A. Correct.

25 Q. Mr. Turvey never raised with you setting up a follow-up

1 meeting with Auto Care, correct?

2 A. Not with me directly, no.

3 Q. And you don't recall him mentioning it to anybody,
4 correct?

5 MR. NADOLENCO: Objection. Never mind. Withdrawn.

6 THE COURT: We're dealing with his understanding.

7 MR. NADOLENCO: Yeah.

8 A. Not to my recollection.

9 Q. And you never heard anything about any follow-up meeting
10 with the Auto Care Association about the Secure Vehicle
11 Interface, correct?

12 A. Not that I can recall.

13 Q. And you were aware of the Secure Vehicle Interface
14 generally before the meeting, correct?

15 A. Yes, I had heard of it before.

16 Q. But you didn't know the specifics, right?

17 A. Not in great detail.

18 Q. And you learned a little bit more at the meeting with Auto
19 Care, right?

20 A. Slightly, not substantially.

21 Q. But you didn't do any follow-up into SVI, the Secure
22 Vehicle Interface, after that meeting, correct?

23 A. I did not directly myself.

24 Q. But you weren't aware that anyone else at GM was doing
25 follow-up into the Secure Vehicle Interface after that meeting

1 with the Auto Care Association, correct?

2 MR. NADOLENCO: Asked and answered.

3 THE COURT: I think it has been.

4 MS. FISCHER-GROBAN: Your Honor, first I asked him if
5 he had done any --

6 THE COURT: I'm just --

7 MS. FISCHER-GROBAN: Of course, Your Honor. I'll move
8 on.

9 THE COURT: I'm just concerned about undue consumption
10 of time, which has to do with the budget that you've provided
11 but also my intention to ensure that what's budgeted is
12 worthwhile. So I sustain the objection in your best interest.

13 MS. FISCHER-GROBAN: Okay. Thank you, Your Honor.

14 Q. So Mr. Tierney, and I'll move on, your testimony in this
15 case is that GM cannot comply with the Data Law, correct?

16 A. That's correct.

17 Q. And it's inconsistent with GM's federal law obligations.
18 That's what you say in paragraph 82 of your affidavit, correct?

19 A. I believe so.

20 Q. And it's contrary to GM's approach to protecting vehicle
21 networks, that's in paragraph 91?

22 A. Correct.

23 Q. And that the concept of access to all vehicle networks or
24 open access platform runs counter to all notions of
25 cybersecurity protections, that's in paragraph 95, correct?

1 A. I agree with that.

2 Q. And all of these conclusions that you're asserting in your
3 affidavit are based on your interpretation of what the law
4 requires, correct?

5 A. It's based on what the law says, yes.

6 Q. And what you understand the law to say, correct?

7 A. Based on the definitions of the words as they're
8 understood in the industry, yes.

9 Q. And for example, you assert in paragraph 80 of your direct
10 affidavit that the Data Law mandates broad access, and I'm
11 quoting, "to a nearly limitless volume of vehicle data,"
12 correct?

13 A. Correct.

14 Q. And you believe that the law requires access to all
15 mechanical data, correct?

16 A. Yes.

17 Q. You also believe that the law requires direct access into
18 the vehicle networks themselves; is that correct?

19 A. Yes.

20 Q. And you similarly believe or you also believe that the law
21 mandates unlimited read-write access to nearly all vehicle
22 components; is that correct?

23 A. Correct.

24 Q. And you believe that the Data Law requires that a wireless
25 device has to attach to the network to be able to read anything

1 without any access controls being in place, correct?

2 A. Correct.

3 Q. And you believe that the law requires that you have to
4 have access to all networks simultaneously, correct?

5 A. Yes.

6 Q. And you believe that the law requires wireless access into
7 every network, even safety critical networks without security
8 mechanisms within our control; is that correct?

9 A. That's correct.

10 Q. And you believe that the law requires access to every
11 electronic networked component of the vehicle encompassing
12 components far beyond anything even remotely related to vehicle
13 diagnosis, repair or maintenance?

14 A. Yes.

15 Q. In other words, that is what you believe the law requires,
16 and then you've concluded that GM can't comply with it; is that
17 correct?

18 A. Correct.

19 MR. NADOLENCO: Objection. Compound.

20 THE COURT: Yes. And I want to uncouple the idea of
21 "can't" and "should not" as is it impossible or is it simply a
22 preferred choice on the part of GM? So let's have several
23 questions to tease that out.

24 MS. FISCHER-GROBAN: Okay, Your Honor.

25 Q. So your testimony in this case, Mr. Tierney, as you said

1 before, is that GM cannot comply with the Data Law, correct?

2 A. Correct.

3 Q. Do you believe that GM could comply with the Data Law?

4 A. Not and meet our obligations to protect the security of
5 our vehicles and the safety of our customers.

6 Q. So you believe it's inconsistent with GM's cybersecurity
7 principles, correct?

8 A. That's correct.

9 Q. And that's based on your interpretation of what the law
10 requires, which we just went through, correct?

11 A. It's based on what the law says, yes.

12 Q. So GM could comply with the law, in other words, as a
13 technical matter, correct?

14 MR. NADOLENCO: Objection. Misstates the testimony.

15 THE COURT: Yes. Well, let me just ask you this: If
16 somebody said -- if I said you had to do it, and I was the only
17 person who had anything to say about it, could you do it?

18 THE WITNESS: Would I do it?

19 THE COURT: Could you do it? This is a matter of
20 possibility. Can you put together a structure that provides
21 all of this access that you say is being called for?

22 THE WITNESS: Correct. Hypothetically, anything is
23 technically possible, of course. However, it's very important
24 to maintain the safety and the security of the systems.

25 THE COURT: Right, I understand the principles. But

1 the point is, as you say, we put a man on the moon, we can do
2 this, too.

3 THE WITNESS: Sure.

4 THE COURT: Okay. Go ahead.

5 Q. Mr. Tierney, you contend in your affidavit that disabling
6 telematics is not a viable solution to the requirements in
7 section 3 of the Data Law; is that correct?

8 A. Yes.

9 Q. But the transmission function of telematics systems in
10 GM's cars can, in fact, be disabled, correct?

11 A. It's possible, correct.

12 Q. So GM's telematics system is called OnStar, right?

13 A. Correct.

14 Q. And the majority of GM vehicles are equipped with OnStar?

15 A. Yes.

16 Q. And OnStar transmits data to GM's back office using a
17 cellular connection, correct?

18 A. Correct.

19 Q. And customers sometimes ask to turn off the transmission
20 function of OnStar, correct?

21 A. They ask to turn off the entire functionality, send and
22 receive, correct.

23 Q. Maybe they don't want the services anymore, right?

24 A. Correct.

25 Q. Or they don't want to pay for it, correct?

1 A. Correct.

2 Q. And for those customers or any customers who don't want
3 OnStar, GM can disable the transmission function of the OnStar
4 wirelessly, correct?

5 A. It is possible, correct.

6 Q. And any software that can be updated over the air using
7 OnStar can also be updated using a service tool, correct?

8 A. Could you restate that. I'm sorry.

9 Q. Of course. So any software that can be updated over the
10 air, using an over-the-air update using the OnStar system can
11 also be updated using a service tool, correct?

12 A. That's correct.

13 Q. But you still say in your affidavit that disabling
14 telematics is not a viable solution to the requirements in
15 section 3 of the Data Law because it is a practical
16 impossibility to disable telematic systems for all vehicles
17 that might one day be resold in the Massachusetts aftermarket;
18 is that correct?

19 A. Correct.

20 Q. So your contention that disabling telematics is not a
21 viable solution is because GM can't control how cars are resold
22 in Massachusetts, correct?

23 A. That is a part of it, correct.

24 Q. So cars could be sold by a second-hand dealer without GM's
25 knowledge, correct?

1 A. Correct.

2 Q. Or there could be a private sale without GM's knowledge,
3 correct?

4 A. Sure, yes.

5 Q. So you first became aware of the ballot question at issue
6 in this case once it was first publicly available, correct?

7 A. I believe so, yes.

8 Q. So sometime before it ended up on the ballot, you were
9 aware of the ballot question?

10 A. I don't recall the exact date, correct.

11 Q. And when you got the ballot question, you took a look at
12 it, correct?

13 A. I did.

14 Q. You'd agree that you looked at the ballot question at a
15 very high level, correct?

16 A. I read the language for what it was, correct.

17 Q. And you'd agree after you read the language for what it
18 was, you decided immediately that it conflicted with GM's core
19 cybersecurity principles, correct?

20 A. I don't know if I'd say "immediately," but it was a pretty
21 easy analysis because it conflicted with our principles, so
22 foundationally.

23 Q. So you agree it was a fast analysis?

24 A. I don't know if it was fast. I'm sure I thought about it
25 because I always think about things, but it was relatively

1 easy.

2 Q. Sure. And as part of that fast and easy analysis, you
3 didn't take any notes, did you?

4 MR. NADOLENCO: Objection, Your Honor. Misstates his
5 testimony.

6 THE COURT: Right. You know, it can be a more concise
7 question without the barbs.

8 MS. FISCHER-GROBAN: Sure. Okay.

9 Q. As part of that analysis, you didn't write anything down,
10 correct?

11 A. Not that I can recall.

12 Q. Didn't take any notes?

13 A. Not that I recall at this point.

14 Q. Didn't draw any sketches?

15 MR. NADOLENCO: Asked and answered.

16 A. Not that I recall.

17 THE COURT: Yes. If we're going to go through the
18 various graphical ways that he could do something like that, I
19 think --

20 Q. Your analysis isn't reflected in any documents, correct?

21 A. Not that I'm aware of, no.

22 Q. And you did that analysis and then you took an early
23 stance that it wasn't achievable, correct?

24 A. Correct.

25 Q. And you based that conclusion based on just reading the

1 language of the law alone, yes?

2 A. It's hard to remember exactly who I might have been
3 involved with. I might have had a conversation with counsel, I
4 can't recall, but based on my understanding of the language,
5 yes.

6 Q. So the 2020 Data Access Law says that it requires that
7 vehicles that have a telematic system be equipped with a
8 platform that's capable of securely communicating all
9 mechanical data, correct?

10 A. Correct.

11 Q. And securely communicating mechanical data from a car is
12 something that would follow under product cybersecurity,
13 correct?

14 A. Correct.

15 Q. And it's your view that engineers acting in good faith
16 always like to try to solve things, correct?

17 A. They do.

18 Q. And you're an engineer, right?

19 A. Mm-hmm.

20 Q. Your direct reports are engineers, the people that report
21 to them are engineers. And when you got the ballot question,
22 you didn't schedule any meetings with your direct reports to
23 talk about a technical solution, did you?

24 MR. NADOLENCO: Objection. It's technically compound.

25 THE COURT: Right. Did you convene any meetings to

1 talk about this?

2 THE WITNESS: Not that I recall.

3 Q. You didn't email any of your reports or engineers that you
4 work with?

5 A. Not that I can recall.

6 Q. And you didn't call any engineers to talk about the law?

7 A. Not that I recall.

8 Q. So the ballot question passed in November. And after the
9 ballot question passed, you didn't attend any meetings about
10 how GM was going to comply with the law after it passed,
11 correct?

12 A. There may have been some meetings with counsel related to
13 data in general but not specific to this.

14 Q. Okay. And you were aware that right after the ballot
15 question passed, a small group of people with GM who you work
16 with started trying to understand if they could come up with a
17 solution to the law; is that right?

18 A. Could you restate it. I'm sorry.

19 Q. Of course. So you're aware that right after the ballot
20 question passed, a small group of people within GM started
21 trying to understand if they could come up with a solution; is
22 that correct?

23 A. I was made aware of that after the fact, yes.

24 Q. And that small group of people included Al Adams, correct?

25 A. Correct.

1 Q. He's your chief product cybersecurity officer?

2 A. Mm-hmm.

3 Q. And some people on his team, yes?

4 A. Correct.

5 Q. And a man named Lawrence Sweeney who leads the IT team; is
6 that right?

7 A. Yes.

8 Q. And so they did what good engineers do; they tried to
9 solve a problem, correct?

10 A. They talked about potentially trying to solve the problem.

11 Q. And after the ballot question passed, around early
12 November, there was a staff meeting that you attended. Do you
13 remember that?

14 A. That's correct.

15 Q. And Al Adams, who we just discussed, who is your direct
16 report, raised at the meeting that the ballot question had
17 passed, and he and his team would begin to understand from an
18 MVP perspective what minimally we need to do to meet the
19 requirements of the law, correct? Does that sound familiar?

20 A. I believe that's what he said, yes.

21 Q. And MVP means minimum viable product, right?

22 A. Correct. It's a term of art in software, yes.

23 Q. So it's whatever is necessary but nothing more, correct?

24 MR. NADOLENCO: Objection. Misstates the testimony.

25 THE COURT: Well, no, I'll permit that. So it's

1 whatever is necessary but not more.

2 THE WITNESS: Exactly.

3 THE COURT: Is that fair?

4 THE WITNESS: It's a term of art in software to mean,
5 you know, what are the requirements and nothing more, nothing
6 less.

7 THE COURT: Okay. It's also known as the rule of
8 parsimony, I think.

9 Q. So after that staff meeting, Mr. Adams asked you what the
10 next steps were for the new law; is that right?

11 A. I believe we had a short conversation.

12 Q. About what the next steps were for the new law; is that
13 right?

14 A. Correct.

15 Q. At that point you decided you were going to stop what
16 Mr. Adams and his team were doing, correct?

17 A. No, that's not correct.

18 Q. Okay. So you decided you needed to have a further
19 conversation with Mr. Adams; is that right?

20 A. At that point we had a conversation with counsel, yes.

21 Q. But you had to have a further conversation because
22 Mr. Adams, the chief product cybersecurity officer, you'd agree
23 didn't have the full context, correct?

24 A. Correct. He was relatively new in his role.

25 Q. Right. So you viewed it as your job to give him the full

1 context, right?

2 A. Yes.

3 Q. So Mr. Adams asked you what the next step was for
4 complying with the law and you pulled in a lawyer, right?

5 A. No. At that point this was a conversation, you know, to
6 be held with counsel.

7 Q. Sure. So you brought in counsel to have that
8 conversation, yes?

9 A. I don't recall if I reached out to counsel or if counsel
10 reached out to me, but it was held with counsel.

11 Q. So Mr. Adams came to you to talk about next steps, and the
12 next step was a conversation with counsel, correct?

13 A. It was.

14 Q. It was two lawyers, right?

15 A. I don't directly recall but probably, yes.

16 Q. And because you invited lawyers to that meeting with
17 Mr. Adams to talk about next steps, the substance of what you
18 discussed is shielded by the attorney-client privilege; isn't
19 that right?

20 MR. NADOLENCO: Objection. That definitely calls for
21 a legal conclusion.

22 THE COURT: Well, it does, and are you asking me to
23 draw an adverse inference as a result of that?

24 MS. FISCHER-GROBAN: No, I'm not.

25 THE COURT: So let's --

1 MS. FISCHER-GROBAN: I'm explaining -- I'm saying you
2 can't talk about what happened.

3 THE COURT: Okay. So let's move beyond that to things
4 that he can talk about legitimately.

5 MS. FISCHER-GROBAN: Of course.

6 Q. After that meeting with you and Mr. Adams and GM's
7 counsel, Mr. Adams and his team stopped trying to come up with
8 a solution to the 2020 Data Access Law; is that right?

9 A. I don't know that they were ever actively working on
10 solving the problem, but I wasn't aware of any further work.

11 Q. In paragraph 82 of your direct affidavit, you refer to a
12 hypothetical attempt by GM to comply with the Data Access Law.

13 THE COURT: I'm sorry. What's the paragraph?

14 MS. FISCHER-GROBAN: Sure. It's paragraph 82.

15 Q. So you say, "In an attempt to comply with the Data Law, GM
16 would have to remove the layered cybersecurity controls it
17 designed and installed in vehicle electrical systems to protect
18 safety and emissions critical functions"; is that correct?

19 A. Yes.

20 Q. But as far as you know, GM didn't do any work before the
21 ballot question passed to try to find a technical solution to
22 the ballot question, correct?

23 MR. NADOLENCO: Objection. Asked and answered.

24 THE COURT: It has been, I think, at some consumption
25 of time, undue consumption of time.

1 MS. FISCHER-GROBAN: I have one last question, Your
2 Honor.

3 Q. And GM didn't do anything to find a technical solution
4 after the law was passed either, correct?

5 A. Not to my knowledge, no.

6 MS. FISCHER-GROBAN: Thank you, Your Honor. No
7 further questions.

8 THE COURT: All right. Mr. Nadolenco. I'm sorry,
9 Mr. Nadolenco, are we just going to keep this in the
10 confidential context?

11 MR. NADOLENCO: Yes, Your Honor.

12 THE COURT: So we'll remain confidential for these
13 purposes.

14 MR. NADOLENCO: Your Honor, may we put up, please,
15 boards that have literally the Data Access Law itself.

16 THE COURT: Sure, whatever.

17 Ms. Beatty points out that people who are on Zoom,
18 assuming that they're still on Zoom or were on Zoom, will be
19 able to see what's transpiring in the courtroom. I just want
20 to be sure that there's no problem with mere observations of
21 what's transpiring in the courtroom.

22 MR. NADOLENCO: Your Honor, they're just quotes of the
23 law, so it should be okay.

24 THE COURT: I'll count on you to police that part,
25 too.

1 MR. NADOLENCO: Thank you, Your Honor.

2 REDIRECT EXAMINATION BY MR. NADOLENCO:

3 Q. Mr. Tierney, good morning. You were asked a number of
4 questions on cross about the scope of GM's cyber protections,
5 and I want to drill down on those, if you please.

6 In particular, can you describe the cyber protections that
7 GM has on safety critical functions like acceleration, steering
8 and braking?

9 A. Yes. We have a number of protections, specifically
10 firmware safeguards, challenge response mechanisms, and also
11 gateway firewalls, for example.

12 Q. Can you describe what the firmware safeguards are and do?

13 A. So firmware safeguards are vitally important to the
14 protection of our software. So the software that sits in our
15 vehicle, in our electronic control units, this actually
16 controls the safety critical systems. It has the instructions
17 for, you know, how our safety critical systems operate. And so
18 firmware safeguards are something -- one of those might be a
19 digital signature, for example. Digital signatures are applied
20 by GM on the software to make sure that when that software is
21 programmed, it's confirmed valid from GM and it hasn't been
22 manipulated by a third party or a malicious actor. So it's
23 very important in the control of the software so that it can't
24 be manipulated in transit or at the ECU.

25 Q. Okay. Currently how are firmware changes made on GM

1 vehicles?

2 A. So firmware changes obviously go through an in-depth
3 development process like we talked about just previously. It
4 goes through development, testing, certification, validation
5 within GM, and then they are signed through our signing service
6 that provides the digital signature that I just mentioned and
7 then securely delivered via either the service tool
8 infrastructure to our dealers and aftermarket repair shops or
9 over the air directly to the vehicle.

10 Q. And why is it done that way?

11 A. So it's done that way for two reasons. One is there's an
12 extremely high number of software across all of our various
13 ECUs and in vehicles globally. So there's a tremendous amount
14 of software to manage, and this software is vitally important
15 to the safety of the vehicle.

16 So, again, like I said, the software controls those safety
17 critical systems that you mentioned. So it's important that we
18 maintain and understand what software goes where so that our
19 customers get the right software at the right time.

20 Q. Why is that important?

21 A. It's important because that software has all the
22 instructions for how the safety critical systems operate, and
23 so whether we deliver it securely through the service tool
24 infrastructure to our aftermarket repair shops and dealers or
25 over the air, that's how we maintain the security and the

1 update of the vehicle.

2 Q. But why is it important for GM to control the software?

3 A. So again, we are uniquely positioned for understanding how
4 our safety systems work and insuring that the right software
5 goes to the right ECU at the right time.

6 Q. You were asked some questions about compliance with the
7 Data Access Law. Would the Data Access Law require modifying
8 that firmware safeguard that you just described?

9 A. Yes.

10 Q. How so?

11 A. So in section 2 where we talk about standardized access,
12 onboard diagnostic systems and vehicle networks without OEM
13 authorization, that would specifically require me to remove my
14 firmware safeguards.

15 Q. And doesn't section 2 give you a choice of how to comply
16 with it?

17 A. I would argue it's somewhat of an illusion of choice
18 because the one option is the removal of all security and the
19 other is moving all that security to an independent entity that
20 doesn't exist today. I have no idea how to vet or what their
21 capability is or could be.

22 And these are some of the most critical systems to GM, not
23 only from a safety and security perspective but from an
24 operational and a business perspective. These sort of services
25 and how we protect our vehicle, we have many of them, almost

1 over ten and growing, and they have to be available 24 by 7 and
2 globally 365 days a year to support manufacturing of our
3 vehicles, manufacturing of components and suppliers, as well as
4 operations in our dealers and in the aftermarket repair shops.
5 So it's vitally important.

6 Q. How would -- you referenced the third party. How would
7 that third party impact GM's control over what software is
8 written in the vehicle?

9 A. It would be --

10 THE COURT: If there's an objection, I want to hear
11 it.

12 MS. FISCHER-GROBAN: Your Honor, this is going well
13 beyond the scope of my cross.

14 THE COURT: I don't think so. So I'm going to permit
15 it.

16 Q. Do you have the question in mind?

17 A. Can you please re-ask it.

18 Q. Sure. You referenced a third party in your prior answer.
19 How would the third party referenced in section 2 of the Data
20 Access Law impact GM's control over what software is written in
21 your vehicles?

22 A. It would be disastrous if we removed firmware safeguards,
23 and any third party can update software whether it's valid from
24 GM or not because that software could be manipulated and
25 properties of the safety systems could be changed that would

1 cause potential safety issues for the customer, as well as
2 emissions controls and calibrations that are vitally important
3 to EPA and CARB, regulators from an emissions perspective.

4 Q. What about section 3; is there anything in section 3 of
5 the Data Access Law that impacts firmware safeguards?

6 A. So directly the requirement for an interoperable
7 standardized and open access platform has a direct data
8 connection to a consumer mobile app, and the ability of sending
9 commands to in-vehicle components. That all taken together
10 does the same thing.

11 Q. Okay. What's the potential impact of removing the
12 firmware safeguards?

13 A. So as I mentioned, removing the firmware safeguards makes
14 it so that those software instructions can be rewritten by
15 anybody and they could cause malicious activity in the vehicle
16 and affect the safety characteristics, as well as performance
17 of the vehicle.

18 Q. But you were asked about GM's defense in depth structure.
19 Don't you have other cybersecurity controls in the vehicle?

20 A. We do. We follow a defense in depth strategy with a
21 number of security controls. However, every security control
22 has a specific purpose. They're there for a specific reason.
23 And while they work together in concert, they don't all have,
24 you know, multiple redundancies. They all have specific
25 purposes.

1 Q. You mentioned in your answer at the top something called a
2 challenge and response mechanism, if I wrote that down right.
3 What are those?

4 A. So challenge and response mechanisms are a mechanism that
5 exists on our vehicle networks that put electronic control
6 units into a kind of special access mode. And those challenge
7 response mechanisms allow something like vehicle programming,
8 ECU programming to occur.

9 Q. I just want to make clear, Mr. Tierney, do the challenge
10 and response mechanisms actually apply to safety critical
11 functionality on vehicles like braking, steering and
12 acceleration?

13 A. They do.

14 Q. Okay. Would complying with the Data Access Law impact
15 GM's challenge and response mechanisms on those safety critical
16 mechanisms?

17 A. Yes.

18 Q. How?

19 A. So for the same words, standardized access, onboard
20 diagnostic systems, vehicle networks, without authorization
21 from the OEM, that would require me to remove those challenge
22 response mechanisms.

23 Q. What could the potential impact be?

24 A. Again, very detrimental to the security of our vehicles
25 and the safety of the customer because now, in addition to what

1 I just mentioned with the firmware changes, the challenge
2 response mechanism is what actually allows the reprogramming to
3 occur. So, again, it takes any ability for GM to authorize
4 that in the process. And so anyone could potentially update
5 software and cause safety and emissions non-compliances.

6 Q. You also mentioned gateways and firewalls. What are
7 those?

8 A. So gateway and firewalls are a tool that's used in many
9 electronic systems and we employ them in the vehicle. What
10 they do is they serve as a mechanism for network traffic. So
11 kind of like a switchyard that shifts signals from one network
12 to another. And what they do in our vehicle in concert with
13 the firewall is act as a way to segregate different networks
14 from each other.

15 And we do that because, of course, in our vehicles we have
16 safety critical control systems that support steering and
17 braking and acceleration. But we also have connected
18 telematics and infotainment systems that do have long-range
19 cyber threats. So it's one of the mechanisms to keep those
20 safety critical systems isolated from those sort of threats.

21 Q. And would the Data Access Law require modifying those
22 safeguards?

23 A. Yes.

24 Q. How so?

25 A. So it's back to section 2 where we talk about standardized

1 access. You know, no authorization and full access to vehicle
2 networks, we would have to remove the gateway and the firewall
3 to provide that access.

4 Q. And what's the potential impact?

5 A. So again, these mechanisms were put in for specific
6 reasons. Our products have an extremely long lifecycle. We
7 have to look ahead, frankly, decades. And this is one of
8 another key protections that's not replaceable or redundant to
9 another one. It actually provides a very key segregation of
10 these networks so that hackers have many steps to get through
11 to potentially do something malicious to the vehicle.

12 Q. Does your cyber team work with the safety team at all?

13 A. We do. We work very closely with the safety team.

14 Q. Explain how that works.

15 A. So within GM, safety and cybersecurity really have been
16 synonymous since the team started. And as we develop new
17 systems and safety critical functions, we work hand in hand
18 with the safety team to ensure that, as we're defining the
19 potential failure modes that can affect the safety system,
20 we're also understanding the potential cyber threats of those
21 systems. And so we work together and we identify the security
22 controls, the need to go into those systems to protect them.

23 Just as engineers want to make sure the systems don't fail
24 and cause safety conditions, we want to make sure that
25 malicious behavior can't make those systems fail as well. So

1 we work together. And in some circumstances we actually have
2 common security elements.

3 Q. You were asked some questions, Mr. Tierney, about turning
4 off telematics. Do you recall those questions on cross?

5 A. I do.

6 Q. Would doing so have any safety related consequences in
7 your view?

8 A. Yes.

9 Q. Do you mind explaining them?

10 A. So our telematics system, and even though without
11 telematics GM vehicles are safe, we do have additional enhanced
12 safety features as a part of our telematics platform that are
13 available to the consumer, things like emergency crash
14 notification, and also we talked about the delivery of firmware
15 over the air. So firmware can be delivered in a very timely
16 fashion to the vehicle to update for security risks and safety
17 risks very quickly.

18 Many times consumers don't bring their vehicle back to the
19 dealer, and they have non-compliances for a long time. And so
20 it's a very critical feature that we have so that more updates
21 can be spread out to the consumer base in a faster way. So
22 those are two examples of features that would no longer be
23 available to the consumer.

24 Q. And that's your firmware that goes to the vehicle?

25 A. That's correct.

1 Q. Not someone else's firmware?

2 A. That's correct.

3 Q. Do firmware updates sometimes impact or affect safety
4 functionality on vehicles?

5 A. Yes, they could.

6 Q. Would you lose that ability to update those safety
7 features if telematically -- start over.

8 Would you lose the ability to update those safety features
9 over the air if you turn off telematics?

10 A. That's correct.

11 Q. You were asked some questions about whether in your
12 background about how you've worked for quite a long time at
13 General Motors and you had a stint at John Deere. Do you
14 recall those questions?

15 A. I do.

16 Q. Do you have any visibility into cybersecurity best
17 practices across the auto industry?

18 A. I do.

19 Q. How do you have that visibility?

20 A. So in my role at GM I also chair a group, an external
21 group called the Automotive ISAC. ISAC stands for Information
22 Sharing and Analysis Center. These are groups, there are many
23 groups across different sectors. There's one in retail, health
24 care, and finance. What they do is they coordinate across the
25 industry on security threats and vulnerabilities.

1 So this group has been in place since 2015. I started
2 chairing it in January of 2019. And we work together with a
3 majority of the OEMs and a large set of our supply base on
4 cybersecurity risks, and we also develop best practices, and
5 those are available on our ISAC website.

6 Q. What OEMs are members of the Auto-ISAC?

7 A. I believe it's all OEMs with the exception of Tesla here
8 in the U.S.

9 Q. I apologize if I missed this. What's your role with
10 regard to the Auto-ISAC?

11 A. I'm the chairman of the group.

12 Q. You were asked some questions about the importance of
13 having a flexible approach to cybersecurity. Do you recall
14 those?

15 A. Yes.

16 Q. Why is that important?

17 A. Flexibility is key in cybersecurity, and I think if you
18 ask any cybersecurity expert, they would say the same thing.
19 If you look at the world around us, cyber events are happening
20 seemingly every day. We see a cyber story, and they're having
21 greater and greater consequence on society. And because those
22 threats are evolving and they're evolving very quickly because
23 the people attacking us are changing their strategies very
24 quickly, we as the protector have to also be able to react
25 quickly. And so flexibility is key because it's truly a cat

1 and mouse game.

2 Q. You were asked some questions about SVI. In your view, is
3 that a solution for complying with the Data Access Law?

4 A. In my view, no.

5 Q. Why not?

6 A. I have not seen any evidence that it's anything beyond a
7 concept. It hasn't been deployed at scale, tested or confirmed
8 to be something that could actually meet the needs of this law.

9 Q. You were asked, Mr. Tierney, some questions by the court
10 about the technical possibility of complying with the Data
11 Access Law. Do you recall that question?

12 A. Yes.

13 Q. I'd like for you to explain, please, what would be
14 involved in analyzing compliance with the Data Access Law?
15 Walk us through that.

16 A. So in terms of --

17 Q. In terms of steps you would need to take as well as how
18 long would those steps take?

19 A. So in terms of if the law was different -- I'm sorry,
20 could you restate.

21 THE COURT: Maybe I can state it.

22 MR. NADOLENCO: Sure, Your Honor.

23 THE COURT: Mr. Nadolenco may or may not agree with
24 what I'm about to say, but let's assume that whoever tells you
25 what to do in the company says, "Do it, comply," how long would

1 it take you, and what steps do you have to take to do it?

2 And maybe a larger question, what's in the critical
3 path in making that choice? And I'll put it in a broader
4 context. Mr. Douglas talked about maybe a four-year period to
5 pull together the locksmith kind of issue. So I guess, if I'm
6 not trenching too much on what Mr. Nadolenco --

7 MR. NADOLENCO: No, Your Honor, that's perfect.

8 A. So I guess from the onset, as written, I don't think any
9 amount of time would give us enough time to meet the law as
10 written.

11 THE COURT: Okay. Stop fighting -- nothing personal
12 but stop fighting the hypothetical. Now you've been told by
13 your boss, "Do it." He really doesn't want to hear your
14 reservations about it.

15 THE WITNESS: Right. So if we were given the mandate
16 to remove our security controls and go down this path, it would
17 be, first of all, a multi-year process to develop a standard.
18 Because it has to be interoperable and standard across makes
19 and models and across the industry. And generally when you
20 look at how standards are developed across the industry, that's
21 a multi-year process just to create the framework.

22 THE COURT: Multi-year could be a hundred years or
23 two. So what are we talking about?

24 THE WITNESS: So I would say generally we see two to
25 three for standardization. This is a very complicated one. So

1 I'd say at least two to three, so probably three.

2 From there it would take at least two years for the
3 OEM to develop the electronics and design the telematics
4 platform, potentially design the network changes and things of
5 that nature. So that's a number of years, two years. Then I'd
6 say another probably two years to actually produce that and
7 work with the suppliers and make the changes in the vehicles.

8 And then from there, you know, I've mentioned many
9 times in my statements we don't just introduce something across
10 all vehicles in one year. It's usually over a number of years
11 because we don't -- we just don't have the capacity to update
12 every vehicle at one time. So there's a number of years there
13 as well. So it's a great many years. I would say, you know,
14 throwing a number out, again, at least seven.

15 Q. Couple more questions, Mr. Tierney. Would complying with
16 the Data Law as written create a safety issue on GM vehicles?

17 A. Yes.

18 Q. Would it require you to undo cyber protections on GM
19 vehicles?

20 A. Yes.

21 MR. NADOLENCO: No further questions, Your Honor.

22 THE COURT: Okay. Let me ask a question, and I'm
23 going to, in this circumstance, let the defendants do
24 additional examination on the issues.

25 But I want to understand more fully what happens with

1 individual consumers who say, "Take the telematics off." You
2 honor that or GM honors that, right?

3 THE WITNESS: Correct.

4 THE COURT: And generally the resistance is it costs
5 money for Global B to work for them and they just don't want to
6 spend the money on it?

7 THE WITNESS: That could be the reason, yes.

8 THE COURT: Isn't that the principal reason?

9 THE WITNESS: It could be that, yes. I would say it's
10 probably the highest percentage, correct.

11 THE COURT: What else?

12 THE WITNESS: Someone could be concerned with privacy
13 or other reasons.

14 THE COURT: Their own concerns about privacy, their
15 own privacy as exposed to you?

16 THE WITNESS: Yes, exactly.

17 THE COURT: So let me then turn back to this question.
18 How many -- what percentage of your consumers say, "Thank you,
19 but no thank you"?

20 THE WITNESS: You know, I don't know the number
21 offhand.

22 THE COURT: Order of magnitude? I'm not trying for a
23 guess. I just want to get a --

24 THE WITNESS: So what I would say is when we deliver a
25 new vehicle, it's very high. We have a -- as a part of the new

1 vehicle sale, you get a certain level of subscription for a
2 certain amount of time, and we see a high, I guess, take rate
3 in the initial model years, and then you generally see it fall
4 off over time, but I don't know the specific percentage.

5 THE COURT: Let's assume a resale of one of those cars
6 in which there has been a fallout, somebody has chosen not to
7 upgrade and somebody, as you describe, isn't as attentive as
8 they might be to their service requirements. How difficult is
9 it to upgrade when there's a sale into the secondary market?

10 THE WITNESS: So how difficult is it to transfer the
11 sale?

12 THE COURT: Yeah. I mean, what I guess I'm getting at
13 is, here is this -- what is it, you refer to a computer on
14 wheels --

15 THE WITNESS: Correct.

16 THE COURT: -- that hasn't been supported for some
17 period of time, and now it's transferred to somebody else. And
18 it doesn't have all the safety features that firmware over the
19 air would provide. How long, or if at all, does it take to get
20 it back up to the level that you would consider to be safe?

21 THE WITNESS: So --

22 THE COURT: Or does it happen? Do people just say,
23 "Well, never mind"?

24 THE WITNESS: There's probably a couple of ways to
25 answer that. It's a complicated question. I guess what I

1 would say is, in general I'll say, if I look back over the last
2 ten years or so of vehicles, we've been very consistent with
3 the functions and the capabilities that are in that vehicle.
4 So as they're sold, they have a long life as it relates to
5 these features, and they're consistent.

6 However, as we develop new vehicles, just like we had
7 additional new safety content over time and we don't go back
8 and change the number of air bags, we're also adding additional
9 safety functions as it relates to telematics, as well as
10 cybersecurity protections. So we try to preserve as long a
11 life, a useful life of those features in the vehicles we
12 launch, but we're also improving and increasing as we move
13 forward.

14 THE COURT: Okay. So if I treat cybersecurity as,
15 call it a bug, rather than a fundamental change like we want
16 air bags in the ceiling, we want air bags on the floor, we want
17 air bags all around, if I just treat it as we've got to update
18 on this to be flexible in dealing with cybersecurity choices,
19 is it the case that you don't -- when there's a secondary sale,
20 there's no effort -- no protocol in place to upgrade the
21 firmware to fix those bugs?

22 THE WITNESS: Not necessarily. Because when secondary
23 sales occur, and I'm not an expert in this, but we do, I think
24 from a sales and marketing perspective, reach out to those new
25 customers and offer the telematics subscription. I'm not an

1 expert in that area. But it is our goal to allow those
2 consumers to understand what opportunities they have on the
3 vehicle.

4 THE COURT: Now, there are -- and this may be beyond
5 your salary bracket or your writ, but there may be two ways, at
6 least two ways of dealing with this. One is to say we're not
7 going to charge for it anymore because we think it's so
8 important that it's embedded, and we're not going to let
9 somebody get away with not updating their firmware. That's one
10 way. Perhaps not as attractive for entrepreneurs than the
11 other way, which is, try to get them to update, but there's a
12 delta there. If they don't update, you don't have that kind of
13 security -- apart from scaling, why is that lack of security
14 any less significant than the lack of security, or more
15 significant, less or more significant, than the lack of
16 security in making wholesale changes in the way in which you
17 deliver?

18 THE WITNESS: Well, when we make updates for security
19 purposes, they're not just delivered over the air. They're
20 also delivered through the service tool infrastructure. So
21 even if -- let's say a vehicle reaches its end of life from a
22 telematics technology perspective, if there's a reason and a
23 necessary need to update a specific piece of software for
24 cybersecurity, it would also be released through that service
25 infrastructure, which would go back as far as we need to go.

1 THE COURT: Let me -- if I understand that -- because
2 I really want to understand the range of this -- it's not a
3 recall.

4 THE WITNESS: Mm-hmm.

5 THE COURT: But it is an encouragement. And so if
6 they wander back into the service, the service people that are
7 capable of dealing with this sort of thing, then they'll get
8 updated at that point. Is that it?

9 THE WITNESS: Correct.

10 THE COURT: All right. I think I'll permit you some
11 time -- if you want to take it right now, that's fine. But I
12 do want to be sure that the Commonwealth gets an opportunity to
13 explore some of these issues.

14 MR. NADOLENCO: Yeah. I would like to follow up, and
15 I understand the court will allow some recross. Would the
16 court like to take a break or --

17 THE COURT: Whatever you want for both of you. I
18 assume that the Commonwealth would like a little time, and I
19 suspect now that you think about it, you would, too.

20 MR. NADOLENCO: Yes.

21 THE COURT: So let's take 15 minutes at this point.
22 We'll be back at 11:05.

23 MR. NADOLENCO: Thank you, Your Honor.

24 THE COURT: Thank you.

25 COURTROOM CLERK: All rise.

1 (Recess, 10:49 a.m. - 11:10 a.m.)

2 MR. NADOLENCO: Thank you, Your Honor.

3 REDIRECT EXAMINATION BY MR. NADOLENCO:

4 Q. Mr. Tierney, you were asked some questions by the court
5 about over-the-air updates. How do over-the-air updates
6 compare with the cybersecurity changes that you were describing
7 would be required under the Data Access Law?

8 A. So over-the-air updates are very helpful in getting our
9 security updates or safety updates out to the field in a fast
10 and substantial way. However, those updates are still
11 available to the aftermarket repair shops and the dealers
12 through our existing means. The protections I talked about
13 earlier, the firmware safeguards, the challenge response
14 mechanisms, the gateway and the firewall, those are fundamental
15 protections to the vehicle, and those are key to actually
16 protecting the platform and cannot just be changed via a
17 software update.

18 Q. What would you have to do to change firmware over the air
19 -- I'm sorry, firmware protections or firewall gateway
20 protections?

21 A. So generally these are substantial changes that would
22 require large scale tear-ups to the modules themselves.
23 Potentially new microprocessors --

24 THE COURT: You said "tear-ups." Tear apart?

25 THE WITNESS: Yes.

1 THE COURT: Okay. I thought you said "tariffs." That
2 was on my mind.

3 THE WITNESS: Tear-ups or redesigns of the electronic
4 systems, changing of the electrical wire circuits and
5 harnessing, potential removal of the gateway. So very
6 substantial physical and electrical changes to the
7 architecture.

8 Q. Are all cybersecurity protections created equal?

9 A. No, they're not.

10 Q. And comparing the three you identified at the outset of
11 your testimony, the firmware protections, the gateway firewall
12 and the challenge and response mechanisms, how would you --
13 give us a sense of how important those are to GM cybersecurity
14 architecture.

15 A. So those are three of our most foundational and most
16 impactful security mechanisms. As we've discussed, we do have
17 a defense in depth strategy. We have a number of different
18 security controls and strategies across our entire vehicle
19 ecosystem, and every mechanism has its own purpose. However,
20 the three we just talked about are pervasive across almost
21 every component and protecting our safety critical systems, and
22 so they're used throughout and extremely important and
23 foundational.

24 Q. And that's not something we're going to just be able to
25 fix over the air; is that fair?

1 A. Correct.

2 Q. Okay. Could you give the court a concrete example of how
3 complying with the Data Access Law, for example, would impact
4 braking systems?

5 A. So for a braking system, for example -- so in our vehicles
6 we have something called an electronic brake control module.
7 It has a set of software running on a microprocessor. That
8 system controls the brakes and has different parameters for how
9 brakes are applied and how antilock braking algorithms work and
10 directly impact the safety of the customer.

11 Those instructions, that software that operates the brake
12 system, that's foundational and I guess meticulously designed
13 by GM, validated, certified and then released. So removal of
14 the security mechanisms, first of all, if we remove the
15 firmware safeguards, it would make that instruction set able to
16 be rewritten because there would be no longer any protection to
17 ensure that that software is valid and from a trusted GM
18 development process. So those instructions could be
19 manipulated. Braking distances could be changed or affected on
20 a vehicle, and that would, of course, have disastrous impact on
21 the customer's safety.

22 Challenge response, again, that's in front of the updating
23 of the software. So not only now you could change the content
24 of the software, the challenge response is kind of the key into
25 actually delivering that software into the vehicle, and the

1 same with the gateway, another protection to avoid making those
2 changes to that ECU. So they're all extremely important in
3 protecting a scenario like that where a piece of brake software
4 could have safety impacts on the customer.

5 MR. NADOLENCO: Mr. Tierney, thank you.

6 THE COURT: You may inquire.

7 CROSS-EXAMINATION BY MS. FISCHER-GROBAN:

8 Q. Mr. Tierney, just a few questions. You testified in
9 response to your counsel's -- I can't remember if it was your
10 counsel or the court's question that even without telematics,
11 GM vehicles are safe. Do you remember that?

12 A. That's correct.

13 Q. And you say that customers can turn off the telematics,
14 can opt to turn off the telematics, correct; you testified
15 about that earlier?

16 A. That's correct.

17 Q. And so those cars are still safe, correct?

18 A. Correct.

19 Q. And there have been no recalls of cars, that you're aware
20 of, because their telematics systems were off, correct?

21 A. Correct.

22 Q. And NHTSA hasn't expressed concern to GM, as far as you
23 know, about the fact that the telematics system can be turned
24 off, correct?

25 A. I don't know if I know that, but I do know they do

1 strongly recommend and support firmware over-the-air updates of
2 vehicles because it does increase our ability to get compliance
3 of safety updates, safety recalls to our consumer because as we
4 talked about, not everyone wants to bring their car into the
5 dealership or the independent repair shop, and so the
6 compliance can be dramatically higher. So they do support it.

7 Q. Of course. But my question was NHTSA hasn't expressed
8 concern to GM about the fact that its OnStar system can be
9 turned off, correct?

10 MR. NADOLENCO: Objection, just to foundation.

11 THE COURT: No. I'll permit him to answer the
12 question.

13 A. I'm not aware of it.

14 Q. Thank you, Mr. Tierney.

15 You testified earlier that you set forth a timeline in
16 response to the court's questions, and you said if you were
17 given a directive that you have to comply with the law, that it
18 would take about seven years. Is that what you testified?

19 A. I did.

20 Q. And you said that at least, you gave it an estimate of
21 about three years of that seven-year time would be to develop a
22 standard, correct?

23 A. Yes, approximately.

24 Q. So if there already were a standard, it would take three
25 years off of that seven-year total, correct?

1 MR. NADOLENCO: Incomplete hypothetical.

2 THE COURT: Well, no. I'll permit it. I suspect that
3 it will be a matter of some concern to me about whether there
4 is anything other than an inchoate standard out there.

5 MS. FISCHER-GROBAN: That's correct, Your Honor.

6 A. I am not aware of a standard that meets the needs of this
7 law.

8 Q. But if there were, you could take the three years off that
9 seven-year estimate, correct?

10 MR. NADOLENCO: Your Honor, same objection.

11 THE COURT: I'll let him answer this question. If
12 something that you think is not there were there, it would take
13 three years off; is that it?

14 THE WITNESS: I am not aware of such a standard, but
15 if that standard existed, then I would agree with you.

16 THE COURT: Okay.

17 Q. Mr. Tierney, have you read the SVI standards?

18 A. I have looked at them, yes.

19 Q. But have you reviewed them?

20 MR. NADOLENCO: Asked and answered.

21 A. I have reviewed them, yes.

22 THE COURT: I'll receive the answer.

23 MS. FISCHER-GROBAN: No further questions. Thank you,
24 Mr. Tierney.

25 THE COURT: Okay. I think that answers the questions

1 that I have as well with Mr. Tierney.

2 I want to -- and while he's here because he may be a
3 voice in the counsels on this. I haven't heard anything that's
4 confidential. I mean, it might have been designated
5 confidential. I haven't heard anything that's confidential
6 here. I recognize -- let me just put it out as a way of trying
7 to think about this.

8 It seems to me important for a variety of reasons of
9 transparency that it be out there as promptly as possible,
10 having in mind the concern that we slip into something.

11 The second is, just to refresh my recollection about
12 this, isn't it -- is the difference between confidential and
13 highly confidential whether it's exposed to other competitors?
14 Is that the kind of dividing line --

15 MR. NADOLENCO: Yes, essentially, Your Honor.

16 THE COURT: -- between that?

17 MR. NADOLENCO: Or other differences, but that's the
18 main one.

19 THE COURT: Okay. All right. I want the parties to
20 be thinking about that because I would like -- maybe we can't
21 do it in realtime, but maybe we can. I just think it's -- as I
22 said, I haven't heard anything. Maybe I'm naive about
23 confidentiality, but I don't think so. So I want you to be
24 thinking through about that.

25 Second, I'm not encouraging anybody to spend too much

1 time with any particular witness to drag the time out, but I
2 don't want any downtime here. So it may well be that we move
3 along briskly enough so that we get yet another witness here.
4 Forewarned is forearmed.

5 MR. NADOLENCO: It's certainly looking that way, Your
6 Honor.

7 THE COURT: All right. So you may step down,
8 Mr. Tierney, thank you.

9 MR. NADOLENCO: Your Honor, as plaintiff's next
10 witness we would call Kevin Baltes to the stand.

11 THE COURT: All right. While we're taking a bit of
12 time, Ms. Beatty points out that if something designated
13 confidential is put into evidence, it will go up on the screen.
14 She can take it down or she can prevent it and she will be
15 using the manipulations here to do that, but I just want to be
16 sure that if we start flashing something that's designated
17 confidential, even if on balance I think how could that be
18 confidential, I'd like to be able to turn it off.

19 MR. NADOLENCO: Yeah, I think we can get creative,
20 Your Honor. Obviously when I'm asking him what are the exact
21 cyber protections on safety critical features, but we'll give
22 some thought to how we can be creative. Maybe if we redact out
23 certain portions of my terminology or his terminology, we can
24 get there.

25 THE COURT: All right. So I take it you're offering

1 Mr. Baltes' declaration.

2 MR. NADOLENCO: Yes.

3 MR. QUEEN: May we move Mr. Baltes' affidavits and
4 exhibits into evidence?

5 THE COURT: Yes, they're received. You may be seated.
6 We're still in, let's say, Global A confidentiality. It may be
7 that tomorrow people will have a Global B that is not so
8 confidential.

9 MS. FISCHER-GROBAN: Your Honor, as we did with
10 Mr. Tierney, I just want to preserve our objections that we
11 made in our motion.

12 THE COURT: You will -- let me just say, I'm not
13 trying to deprive you of the opportunity to embed in this
14 record objections that I've overruled on a provisional basis,
15 but I'll take a standing objection to the determinations that I
16 made. Right. So you don't have to go through that.

17 MS. FISCHER-GROBAN: Thank you, Your Honor. If I may
18 approach with the binders.

19 THE COURT: Yes.

20 KEVIN M. BALTES, Sworn

21 COURTROOM CLERK: Please state your full name and
22 please spell your last name.

23 THE WITNESS: Kevin Michael Baltes, B-a-l-t-e-s.

24 MS. FISCHER-GROBAN: Your Honor, just to be clear, I
25 think this is the case, but this is another one of the

1 witnesses where, unfortunately, the confidential information is
2 immeshed.

3 THE COURT: I'm assume that's what we're dealing with
4 now until we decide otherwise.

5 MS. FISCHER-GROBAN: Thank you. Everybody we have in
6 the courtroom is subject to the protective order with respect
7 to confidential information.

8 CROSS-EXAMINATION BY MS. GROBAN:

9 Q. Good morning, Mr. Baltes. My name is Phoebe
10 Fischer-Groban, and I represent the Attorney General in this
11 case.

12 You've worked for GM since 1995, correct?

13 A. Yes.

14 Q. That's over 25 years?

15 A. Yes.

16 Q. And you've never worked at any other automobile
17 manufacturer; is that correct?

18 A. Yes.

19 Q. And today you're the director of product cybersecurity at
20 GM?

21 A. Yes.

22 Q. Correct. And you lead about 55 people in that department,
23 correct?

24 A. Yes.

25 Q. And you report to Al Adams, who is the chief product

1 cybersecurity officer; is that right?

2 A. Yes.

3 Q. And Mr. Adams reports directly to Mr. Tierney, correct?

4 A. Yes.

5 Q. In paragraph 2 of your affidavit, you mention electric
6 control units or ECUs. I just want to ask you a few questions
7 about those. If you want to, your affidavit is in your binder
8 and it's also going to be up on the screen but feel free to go
9 to your affidavit in the binder in front of you.

10 Great. So ECUs make up the electrical architecture of
11 a vehicle; is that correct?

12 A. Yeah, they are a constituent of the electrical
13 architecture, yeah.

14 Q. In your affidavit, you attached to your affidavit
15 something that's been marked as Trial Exhibit 41, which is a
16 slide deck that's titled "Electrical Architectures," and it
17 discusses GM's Global A and Global B architectures, right?

18 A. Yes.

19 Q. And Global B is GM's newest electrical architecture,
20 correct?

21 A. Yes.

22 Q. And in your view, don't you agree, that it takes about
23 five to seven years to develop a new electrical architecture,
24 correct?

25 A. Yes, roughly.

1 Q. Your direct affidavit also discussions GM cybersecurity
2 controls, and I have a few questions, more questions on what's
3 addressed in your affidavit about the controls. So going back
4 to your affidavit, you say that ECUs control nearly every
5 function in today's vehicles, right?

6 A. Yes.

7 Q. And you also talk in your affidavit about the controller
8 area network, or the CAN for short, bus which connects ECUs and
9 allows ECUs to communicate with one another, right?

10 A. Yes.

11 Q. And a CAN frame is another word for a defined message
12 that's sent and received among the ECUs in the vehicle,
13 correct?

14 A. Yes.

15 Q. And the ECUs that compose the electrical architecture of
16 the vehicle are programmed with software, correct?

17 A. Yes.

18 Q. And the software in the ECUs define the frames or messages
19 that each particular ECU is capable of sending and receiving,
20 correct?

21 A. Yes.

22 Q. And if an ECU receives a message that its software hasn't
23 defined, that ECU will reject the message, correct?

24 A. Yes.

25 Q. You also talk in your affidavit in paragraph 16 about

1 something called secure unlock. I'm going to ask you a few
2 questions about secure unlock.

3 Secure unlock, as you explain it in paragraph 16 of your
4 affidavit, is the process of raising the privilege level of an
5 ECU to allow a critical repair, right?

6 A. Yes.

7 Q. And it's a requirement for basically all of the components
8 that GM sources for its vehicles, correct?

9 A. The ECUs support secure unlock.

10 Q. Yes. And -- thank you. The way secure unlock works is
11 that the technician uses a service tool to make a repair and
12 the ECU presents a challenge to the tool, correct?

13 A. Yes.

14 Q. And the tool sends the challenge to GM's back office,
15 correct?

16 A. Yes.

17 Q. And GM's back office has the response to the challenge,
18 correct?

19 A. It computes the response, yes.

20 Q. Yes. And it sends the response back to the tool?

21 A. Yes.

22 Q. And the tool -- if the response that is sent back to the
23 tool is what the ECU thinks it's going to be, the vehicle
24 enters the privilege state that allows the technician to
25 perform the repair, correct?

1 A. The tool gets the response from the back office, sends it
2 to the ECU. If it matches what the ECU computes, yes, it is
3 unlocked for additional repair.

4 Q. So in the secure unlock process that we're talking about,
5 it's GM's back office that stores the real secrets, correct?

6 A. Yes.

7 Q. They're not in the tool, correct?

8 A. They're not in the tool.

9 Q. And the tool is only -- putting it another way, the tool
10 is only an intermediary between the ECU and GM's back office,
11 correct?

12 A. Yes.

13 Q. In paragraph 18 of your affidavit, you discuss long range
14 connectivity which includes cellular connectivity, correct?

15 A. Yes.

16 Q. And I have a few questions about cellular connectivity.
17 So ECUs that have cellular connectivity have certificates
18 installed in them, correct?

19 A. Yes.

20 Q. And this is called a public key, or the way this is set up
21 is called a public key infrastructure, right?

22 A. That's not the only way to do it, but that's the way we
23 have done it, yes.

24 Q. That's the way that GM has done it. Or an acronym for
25 that is PKI, correct?

1 A. Yes.

2 Q. And a PKI, a public key infrastructure requires a
3 certificate authority to issue and maintain these certificates,
4 correct?

5 A. Yes.

6 Q. And the way GM has set up its PKI that we're talking about
7 is that GM is a certificate authority, correct?

8 A. Yes.

9 Q. So by the way, you say in paragraph 30 of your
10 affidavit -- feel free to flip there -- that the Data Law would
11 require GM to remove itself from the chains of authorization
12 and authentication, correct?

13 A. Yes.

14 Q. And you understand, though, that the Data Law doesn't say
15 that there can't be a certificate authority, correct?

16 A. No. It says that there's no authorization by the
17 manufacturer.

18 Q. It's just that GM can't be the certificate authority,
19 right?

20 A. That's what it says.

21 Q. So the ECUs that are capable of a cellular connection use
22 a communication protocol for that connection that's called
23 transport level security or TLS 1.2; is that right?

24 A. No. It's transport layer security.

25 Q. Transport layer security. I apologize.

1 So the ECUs that are capable of a cellular connection use
2 a communication protocol called transport layer security; is
3 that correct?

4 A. Yes.

5 Q. Thank you for correcting me.

6 And that protocol creates a secure connection, correct?

7 A. Yes, between the GM back office and the vehicle.

8 Q. I have a few other questions about diagnostic functions.
9 You say in paragraph 27 of your affidavit, and please feel free
10 to flip there, that GM does not allow OBD tools to perform
11 functionality that could be used to circumvent security
12 controls or compromise safety critical vehicle functions.
13 Right?

14 A. Yes.

15 Q. So diagnostic trouble codes, diagnostic trouble codes are
16 codes that live in the vehicle and that you read using the OBD
17 service tool, correct?

18 A. Yes.

19 Q. And that's called performing a DTC read function, right?

20 A. Yes.

21 Q. That's a diagnostic function, correct?

22 A. It is.

23 Q. And a vehicle will only support a finite number of
24 diagnostic trouble codes, correct?

25 A. At any point in time based on the software it will support

1 a defined number of codes, yes.

2 Q. That's because the diagnostic trouble codes are predefined
3 in the software in each of the ECUs that compose the vehicle,
4 correct?

5 A. Yes.

6 Q. A DID read, another diagnostic function, correct?

7 A. Yes.

8 Q. That's a diagnostic function that allows you to retrieve
9 data from a vehicle using a service tool, right?

10 A. Yes.

11 Q. And like the diagnostic trouble codes DID reads are also
12 predefined in the ECUs, correct?

13 A. Yes.

14 Q. And DID writes are another function, correct, another
15 diagnostic function?

16 A. Yes.

17 Q. And they allow, the DID writes, allow a technician to
18 write something to the memory of an ECU, correct?

19 A. Yes.

20 Q. And all of the DID write commands similarly are already
21 coded into the ECUs, correct?

22 A. Yes.

23 Q. And rid is another diagnostic function, correct?

24 A. Yes.

25 Q. And a rid is a function that allows you to trigger some

1 sort of function in the vehicle, correct?

2 A. Yes.

3 Q. And just like all the other functions we've been talking
4 about, all of the possible rids are predefined in the ECUs,
5 correct?

6 A. Yes.

7 Q. And they're coded into the ECUs when they're built,
8 correct?

9 A. Yes, with a program with the software.

10 Q. In the programming of the software of the ECUs?

11 A. Yes.

12 Q. If you wanted to update ECUs to add new diagnostic
13 functions after the vehicle is in the field, that could be
14 done, correct?

15 A. If the hardware supports said new diagnostic function,
16 then theoretically, yes, you could update the software in the
17 field.

18 Q. You can also ban certain diagnostic functions, correct?

19 A. Yes.

20 Q. And so what this means is, if you agree, these functions
21 aren't programmed into the ECU so the ECU doesn't support that
22 particular function, correct?

23 A. Yes.

24 Q. And it doesn't support it for anybody, correct?

25 A. It could be the case, yes.

1 Q. And if someone sent one of the banned functions into the
2 ECU, the ECU would respond that it was unknown or invalid or
3 something like that, correct?

4 A. Yes.

5 Q. And the ECU won't let that banned function happen, right?

6 A. Correct.

7 Q. And your department product cybersecurity at GM has banned
8 certain functions that are in the ECU, correct?

9 A. Yes.

10 Q. So, for example, product cybersecurity has banned a
11 function that overwrites data or software calibrations in the
12 ECU, right?

13 A. Yes.

14 Q. And you've also banned a function that would allow someone
15 to download and execute malware in the ECU, correct?

16 A. Yes. There are diagnostics that download to memory that
17 we don't use for programming.

18 Q. Yes. And those have been banned. So if someone tried to
19 use those functions, the ECU is programmed so it will respond
20 so that the function isn't supported, correct?

21 A. Yes.

22 Q. And the function won't happen, correct?

23 A. Correct.

24 Q. And we talked a little bit earlier about secure unlock and
25 the process of raising the privilege level of an ECU to allow a

1 critical repair. So safety or security critical diagnostic
2 functions can be moved behind secure unlock, correct?

3 A. Yes.

4 Q. Now I have a few questions -- some more questions about
5 secure diagnostics. In paragraph 17 of your affidavit you
6 discuss secure diagnostics. I just have a few follow-up
7 questions about those. Rationality checks are part of secure
8 diagnostics, right?

9 A. Yes.

10 Q. And rationality checks make sure that before a diagnostic
11 is executed, the vehicle is in a safe condition to do so,
12 correct?

13 A. Yes.

14 Q. So, for example, that the vehicle is not moving, right?

15 A. That would be one condition, yes.

16 Q. Those rationality checks are programmed into the ECU
17 components, correct?

18 A. Yes.

19 Q. And all ECUs have rationality checks, correct?

20 A. I can't attest to all of them, but safety critical ECUs
21 have rationality checks.

22 Q. Moving to the central gateway, in paragraphs 22 and 23 of
23 your affidavit you discuss the central gateway, and I have a
24 few questions about the gateway. The central gateway, as you
25 describe it, screens all messages coming into the vehicle,

1 correct?

2 A. It can't screen -- it's positioned such that it screens a
3 subset of the messages depending on how the messages enter the
4 vehicle. It may not or may not pass through the gateway.

5 Q. So in your affidavit you say, "The central gateway is a
6 gateway ECU that screens all messages coming into the vehicle
7 from the OBD port."

8 A. Yes. So I didn't contradict myself. It does screen
9 messages coming into the vehicle from the OBD port, but not
10 everything coming into the vehicle.

11 Q. Understood. And a message is another word, we talked
12 about this before, for CAN frame, correct?

13 A. Yes.

14 Q. The way that the central gateway screens the messages that
15 you talk about in your affidavit is that each message has a
16 unique identifier, correct?

17 A. Yes.

18 Q. And the central gateway is programmed so that it only lets
19 in certain messages that have certain identifiers, correct?

20 A. Yes.

21 Q. And the gateway is programmed according to a policy that's
22 set forth by product cybersecurity, correct?

23 A. Yes, and others.

24 Q. Yes, and others. If you would -- well, let me just ask
25 this question: That policy can change year to year, correct?

1 A. Yes.

2 Q. If you'll open up your binder and take a look at what's
3 been marked as Trial Exhibit 516, do you recognize this
4 document?

5 THE COURT: I think it may be a different binder up
6 there.

7 MS. FISCHER-GROBAN: It should be in his cross binder.

8 A. I see it.

9 MS. FISCHER-GROBAN: So the next three exhibits are
10 exhibits that we are entering through this witness.

11 THE COURT: Okay.

12 Q. Do you recognize this document?

13 A. No.

14 Q. Oh. If you'll turn to page 517, to tab 517.

15 A. Oh, okay.

16 Q. There's a document marked 517. Do you recognize that
17 document?

18 A. No.

19 Q. Okay. If you'll go to the tab marked 518, there's a
20 document behind there. Do you recognize that document?

21 A. No.

22 Q. Okay. Going back to the central gateway, if the central
23 gateway gets a message with an identifier that the central
24 gateway isn't supposed to get, it will reject it, right?

25 A. Yes.

1 Q. And it's programmed to know what diagnostic functions to
2 let through, correct?

3 A. Yes.

4 Q. And diagnostic functions that the gateway is not
5 programmed to let through won't be allowed to pass through,
6 correct?

7 A. Yes.

8 Q. Switching topics, you know what the federal motor vehicle
9 safety standards are, correct?

10 A. I'm familiar with them. I don't study them or know them
11 in my day job.

12 Q. Understood. And you're not aware of any federal motor
13 vehicle safety standard that governs cybersecurity, correct?

14 A. Correct.

15 Q. In paragraph 29 of your direct testimony affidavit, you
16 say that GM -- take a minute to get there. You say that, "GM
17 reviewed the Data Law and realized early on that there was no
18 solution to what the Data Law required that would still provide
19 adequate cybersecurity and safety protections for our
20 customers." Did I read that correctly?

21 A. Yes.

22 Q. And this assertion is based on what you and your
23 colleagues at GM believed the law requires, correct?

24 A. Our interpretation of the law, yes.

25 Q. And you believe that the Data Access Law requires broad

1 access to data that is not necessary for vehicle diagnosis,
2 maintenance and repair, correct?

3 A. That's what's written in section 2, yes.

4 Q. And it's also written in your affidavit, correct?

5 A. Yes. That was my interpretation of section 2.

6 Q. And you also believe that the open access, the phrase as
7 that's used in section 3 of the 2020 Data Law, which hopefully
8 is in front of you, means no authentication or authorization
9 can be required by any entity trying to exchange information
10 with our vehicles, correct?

11 A. Yes, unrestricted access with no authorization from GM.

12 Q. Well, but you believe it requires no authentication or
13 authorization by any entity, correct?

14 A. There would be no entity third party that we would trust
15 to secure authorization of our systems.

16 Q. So there could be authorization and authentication by an
17 entity, correct?

18 A. By an entity?

19 Q. Yes.

20 A. There could be.

21 Q. But just not GM, correct?

22 A. It would be unsafe, but yes.

23 Q. And you also believe that the 2020 Data Access Law
24 requires unfettered bidirectional unauthorized access to GM's
25 vehicles and vehicle networks; is that correct?

1 A. Yes.

2 Q. And you believe also that any solution that complies with
3 the language of the law which is in front of you as you
4 understand it is going to undermine GM security, correct?

5 A. And safety, yes.

6 Q. And in your view it doesn't matter what solutions are
7 proposed, those solutions are going to undermine safety and
8 security, correct?

9 A. If they meet the Data Law, yes.

10 Q. Based on your understanding of the law, correct?

11 A. Yes.

12 Q. And you know that the secure vehicle interface is an issue
13 in this case, correct?

14 A. Yes.

15 Q. It's one of the solutions that the Attorney General's
16 experts have proposed in this case, correct?

17 A. Yes.

18 Q. And the secure vehicle interface is comprised of three
19 technical standards that are published by the International
20 Organization for Standards, correct?

21 A. ISO specs, yes.

22 Q. And you haven't reviewed those standards, have you?

23 A. No.

24 Q. And as far as you know, no one in product cybersecurity,
25 which is the department you're the director of, has reviewed

1 the ISO standards, correct?

2 A. Correct.

3 Q. But in your view, your view of the law, though, it's so
4 flawed that it doesn't even matter what the ISO standards say,
5 right?

6 A. My view of the law is not flawed. My view is that it
7 doesn't matter whether it's the SVI or any other technical
8 solution. If it meets the Data Law, it puts our customer
9 safety at risk.

10 Q. As far as you know, GM has made no efforts to develop a
11 technical solution to the 2020 Data Access Law, correct?

12 A. Correct.

13 MS. FISCHER-GROBAN: No further questions. Thank you
14 so much, Mr. Baltes.

15 THE COURT: All right. Mr. Queen.

16 REDIRECT EXAMINATION BY MR. QUEEN:

17 Q. Mr. Baltes, I just have -- can you hear me?

18 Mr. Baltes, I just have a few questions for you on
19 redirect.

20 The Attorney General's counsel mentioned a cybersecurity
21 feature called secure unlock. Do you remember that?

22 A. Yes.

23 Q. And can you explain for us what that means?

24 A. Secure unlock is one of our security controls that is used
25 to raise the privilege level of our ECUs such that safety or

1 security critical repair can be done. It's a challenge
2 response mechanism for authorization from the GM back office to
3 allow these enhanced diagnostics to be performed by the repair
4 person.

5 Q. And why is secure unlock important for the cybersecurity
6 of GM vehicles?

7 A. The vehicle has a lot of diagnostics, and not all
8 diagnostics are meant for all users. And so with our secure
9 unlock we can restrict diagnostics to particular user bases so
10 it doesn't allow unrestricted access to everyone to perform all
11 diagnostics, and it's all within the intent of keeping the
12 motorist and repair person safe.

13 Q. If GM is not permitted to require direct or indirect
14 authorization to its vehicles onboard diagnostic systems, could
15 GM keep its secure unlock protection?

16 A. No. The way the mechanism works, as was described
17 earlier, with the challenge being sent to the GM back office,
18 only the GM back office has the secrets and authorization to
19 generate the correct response to the challenge, which is then
20 sent back to the vehicle via the tool and matches it with the
21 ECU. So GM holds the secrets, really the master secrets that
22 works across all ECUs to perform the secure unlock.

23 Q. And if GM is required to equip its vehicles with an open
24 access platform, could GM keep its secure unlock protection in
25 place?

1 A. No. The authorization that GM requires to have the secure
2 unlock work would have to be removed.

3 Q. The Attorney General's counsel also mentioned the secured
4 gateway. Do you remember that?

5 A. I do, yes.

6 Q. Can you explain for us again what that means?

7 A. Yeah. The secured gateway is a special purpose ECU in our
8 vehicle that serves to restrict and filter message traffic
9 among the ECUs along with the bidirectional communications with
10 the OBD port.

11 Q. And why is the secured gateway important for
12 cybersecurity?

13 A. It serves to really contain attacks. If there were a
14 module that were to be compromised, the goal is likely to
15 spread that compromise to another ECU. So the gateway kind of
16 serves as a firewall, as we kind of all understand what
17 firewalls do, to block that adversary from spreading that
18 attack to other safety critical systems.

19 Q. And if GM is not permitted to require direct or indirect
20 authorization for access to its vehicles' onboard diagnostics
21 systems, could GM keep the secured gateway in its vehicles?

22 A. No, no. I mean, the software that's in the gateway, the
23 controls, all the functionality I just described, can be
24 replaced with rogue software from an adversary if we didn't
25 have controls like secure programming and secure unlock to

1 protect it.

2 Q. And if GM is required to equip its vehicles with an open
3 access platform, could GM keep its secured gateway?

4 A. No, no. The call for no authorization from GM, the fact
5 that the way we have our software designed and implemented in
6 the gateway, it basically authorizes communications across the
7 ECUs in the vehicle as well as to and from the OBD port.

8 Q. You just mentioned the secured programming control. Can
9 you explain for us what that is?

10 A. Yeah. Secured programming is our control whereby we
11 insure only authentic, untampered GM software can be installed
12 in our ECUs.

13 Q. Does that have anything to do with a modification of what
14 is on an ECU?

15 A. Yeah, yeah. The ECUs will do whatever the software is
16 designed for it to do. So if the software can be changed in a
17 way that doesn't come from GM, then really the ECU can do
18 whatever it wants, and that includes removing security controls
19 and impacting safety critical systems.

20 Q. So you might have just answered this question for me, but
21 can you explain why it is that secure programming is essential
22 to vehicle cybersecurity?

23 A. The way that we protect it is by adding a digital
24 signature to the software, okay. So our back office is the
25 only entity that authorizes and can create that digital

1 signature which is embedded within the software such that
2 during installation the signature is checked. So if absent
3 that, if someone is able to reprogram software in the ECU, he
4 or she has complete control over what that ECU can do,
5 including removing security controls and removing functions
6 that impact safety and emissions.

7 Q. And if GM is not permitted to require direct or indirect
8 authorization for access to its vehicle or onboard diagnostic
9 systems, could GM keep its secure programming function?

10 A. No, no. The digital signature created in our back office
11 would have to be removed because that's an authorization of our
12 software that protects it, so we could no longer do that.

13 Q. And if GM is required to equip its vehicles with an open
14 access platform, could GM keep its secure programming function
15 in place?

16 A. No. Again, the no authorization by the manufacturer would
17 make that something we can no longer do.

18 Q. I think the Attorney General's counsel mentioned secure
19 diagnostics. Do you remember that?

20 A. Yes.

21 Q. If GM were required to remove its secure unlock and its
22 secure programming and its secured gateway, could the secure
23 diagnostic function fully protect GM vehicles?

24 A. No, not fully protect. The secure diagnostics, the
25 rationality checks we talked about, you know, making sure the

1 vehicle is in a safe condition is really a last line of
2 defense.

3 THE COURT: I'm sorry. It's really a what kind of --

4 THE WITNESS: A last line of defense.

5 THE COURT: Okay.

6 A. So with our defense in depth strategy, our goal is to have
7 layers that an attacker has to overcome. And so if we remove
8 all the layers and only rely on that last kind of security
9 check, we're really making it a lot easier for an adversary to
10 have a successful attack.

11 Q. Okay. Section 3 of the Data Access Law, which is right up
12 there, it requires that the platform be directly accessible by
13 the owner of the vehicle through a mobile-based application.
14 Do you see that?

15 A. I do.

16 Q. Does GM currently have the ability to make its entire
17 platform directly accessible to the owner of the vehicle
18 through a mobile-based application?

19 A. No.

20 Q. And why is that?

21 A. We try to limit the number of attack factors into our
22 vehicle. So the notion of having a mobile-based application
23 being able to interface with our whole vehicle network and all
24 the ECUs is with a lot of risk, and we're in the business of
25 mitigating that risk. So this is really something that would

1 not be good from a safety perspective for our customers.

2 Q. For the benefit of the court, can you explain what an
3 attack factor is?

4 A. Attack factor is any interface into the vehicle, physical
5 or wireless, that an adversary could use to gain control or a
6 foothold into the vehicle where, after, they can launch maybe
7 further attacks.

8 Q. So what are the attack factors that are introduced through
9 the mobile-based application?

10 A. You know, assuming this is WiFi or some other
11 radiofrequency connection, this would be an additional
12 connection to the vehicle, and in our business day to day, our
13 job is to analyze those connections very stringently to ensure
14 that we have security controls in place to protect them. So
15 the notion of having an additional wireless connection to not
16 just an ECU but to the whole platform and networks is a little
17 scary from a cyber perspective because it really broadens the
18 attack service on the vehicle.

19 Q. Is the mobile device itself a new attack factor?

20 A. No, not the device itself. We assume the device is
21 compromised, and if it's going to connect to the vehicle, we
22 have to assert worst case.

23 Q. All right. Can GM comply with section 2 of the Data
24 Access Law today?

25 A. No. Not while keeping our customers safe, no.

1 Q. And why is that?

2 A. A few reasons. One, there's no authorization required by
3 the manufacturer, and we have authorization throughout all of
4 our security controls to ensure the safety of our customers.
5 There's the access to vehicle networks, which is broader than
6 the access to the OBD systems that we have today, so it's just
7 access to more. Any time you access more, there's more risk.

8 And then lastly, the notion of having a third-party entity
9 is untenable as well because at the end of the day, customer
10 safety is our top priority, and GM has to hold the secrets to
11 make sure that happens. We wouldn't trust a third party to
12 protect our customers. So we need to hold the authorization
13 system.

14 Q. And can GM comply with section 3 of the Data Access Law
15 today?

16 A. No.

17 Q. And why is that?

18 A. It calls for an open access platform which has a lot of
19 bad characteristics from a security perspective in the sense
20 that it's free access to information in vehicle networks and
21 vehicle functions for everyone with unrestricted use with no
22 authorization required by the manufacturer. That's just a lot
23 of open ground for risk to be added to our vehicle that can
24 pose a safety risk to our customers.

25 Q. And if it were forced to comply with the Data Access Law,

1 what would GM need to do?

2 A. Probably re-architect our whole system. It would -- I
3 don't know how we would keep our vehicle safe and secure and
4 still meet the language of the Data Law.

5 MR. QUEEN: Okay. I have no further questions.

6 THE COURT: All right. You may step down. Thank you.
7 Next witness.

8 MR. LINDER: Thank you, Your Honor. At this time the
9 plaintiffs would call Mark Chernoby to the stand and ask for
10 admission of his affidavit and associated exhibits.

11 THE COURT: Right. And it's received on the same
12 basis that I've been receiving these.

13 MR. LINDER: Thank you, Your Honor.

14 MICHAEL M. CHERNOBY, Sworn

15 COURTROOM CLERK: Please state your full name and
16 please spell your last name.

17 THE WITNESS: My full name is Mark Michael Chernoby.
18 Last name is spelled C-h-e-r-n-o-b-y.

19 THE COURT: You may inquire.

20 MS. FIMOGNARI: Your Honor, before I begin I just want
21 to note that this cross-examination will be confidential as
22 well so we'll continue under the confidentiality.

23 THE COURT: Okay. I'm working on that assumption for
24 now.

25 CROSS-EXAMINATION BY MS. FIMOGNARI:

1 Q. Good afternoon, Mr. Chernoby. My name is Christine
2 Fimognari, and I represent the Attorney General in this case.

3 Mr. Chernoby, your position is FCA's chief technical
4 compliance officer, correct?

5 A. That's correct.

6 Q. And you have been employed at FCA since 1983; is that
7 right?

8 A. That's correct.

9 Q. FCA is the only vehicle automaker that you have worked
10 for, correct?

11 A. That is correct.

12 Q. In your role at FCA, you have responsibility for vehicle
13 safety and regulatory compliance in North America, correct?

14 A. I have responsibility for technical compliance around the
15 world, but yes, also North America.

16 Q. Including North America?

17 A. Yes.

18 Q. All FCA vehicles have OBD-II ports, correct?

19 A. In the United States, yes, all FCA vehicles have OBD-II
20 ports.

21 Q. Yes. Unless I clarify otherwise, we'll be talking just
22 about vehicles in the United States today.

23 A. Okay.

24 Q. And Mr. Chernoby, diagnostic functions are available
25 through the OBD-II port, correct?

1 A. That is correct.

2 Q. And diagnostic functions at FCA are predescribed and
3 loaded onto the software of each individual electronic control
4 unit or ECU, correct?

5 A. Yes, they're loaded on to the ECUs that have diagnostic
6 functions, that's correct.

7 Q. And some FCA vehicles have telematics systems; is that
8 right?

9 A. That is correct.

10 Q. And FCA has different types of telematics systems?

11 A. That is correct.

12 Q. One type of telematic system that you're familiar with is
13 VP4?

14 A. VP4 describes an entire infotainment unit. Inside that
15 infotainment unit is a board, a set of hardware that conducts
16 telematics.

17 Q. And another type of telematic system or infotainment unit
18 that you're familiar with is R1, correct?

19 A. That's correct.

20 Q. And FCA transmits information from its vehicle telematics
21 system to third parties such as Sirius XM, correct?

22 A. That is correct.

23 Q. And FCA sometimes brings in outside hacking experts as
24 part of its cybersecurity testing, correct?

25 A. That is correct.

1 Q. Now, Mr. Chernoby, in your direct testimony you testified
2 about the expected impact of the Data Access Law on FCA, right?

3 A. Yes. I responded to a series of questions, yes.

4 Q. And one requirement of the Data Access Law that you
5 testified about is the requirement for an open access platform
6 with read-write capabilities, correct?

7 A. Yes.

8 Q. And in paragraph 81 of your affidavit, you provided an
9 opinion on what you believe FCA would have to do to develop an
10 open access platform. And Mr. Chernoby, if you'd like to look
11 at it, your affidavit is the first tab in your binder.

12 A. Is it okay if I just --

13 Q. It's also on screen. That's fine, whatever you prefer.

14 A. Okay.

15 Q. So in paragraph 81 you provided an opinion on what you
16 believe FCA would have to do to develop an open access
17 platform, correct?

18 A. Yes, I understand what I responded to in Paragraph 81,
19 correct.

20 Q. And that opinion is based, at least in part, on your
21 interpretation of the phrase "open access," right?

22 A. Yes.

23 Q. And you interpret the phrase "open access" to mean that no
24 authorization or security clearance is needed to read or write
25 data, correct?

1 A. Yes, I interpret open -- taken out of context, the two
2 words "open access" to mean that we would have -- an automaker
3 would have no ability to put any protection and/or roadblock in
4 to access those systems.

5 Q. And based on that particular interpretation of open
6 access, it's your view that under the law, FCA could no longer
7 have any control over who accesses vehicle software, correct?

8 A. Well, the two words "open access" taken out of context
9 don't necessarily describe what role FCA can have, but when you
10 look at the other elements of the Data Law, there are clearly
11 sentences that talk about unaffiliated with manufacturers, et
12 cetera, which would take FCA or any other automaker out of the
13 loop.

14 Q. So Mr. Chernoby, in paragraph 81, the first sentence
15 says -- of your affidavit says, "Developing an interoperable,
16 standardized, open access platform is fundamentally at odds
17 with the notions of cyber protections." Did I read that
18 correctly?

19 A. Yes, you did.

20 Q. This paragraph does not get into the requirements of
21 section 2, correct? It only addresses the platform in section
22 3?

23 A. I don't recall what question was posed at the time I
24 responded to paragraph 81. But clearly the sentence is really
25 pointed at the question of an open access platform.

1 Q. Okay. So within the context of section 3 of the law, it's
2 your view that FCA could no longer have any control over who
3 accesses vehicle software due to the open access requirement,
4 correct?

5 A. Can I take a second to read section 3?

6 Q. Yes, you may.

7 A. With the words "open access" in this context, I would
8 interpret that we have to make it completely open for anybody,
9 including when it gets into mobile-based applications for
10 owners, which typically there are multiple owners of an
11 individual vehicle. So yeah, it would be a very, very broad
12 audience, and we would not be involved in limiting access to
13 any of those people.

14 Q. And that access includes access to vehicle software,
15 correct?

16 A. That's the way I would interpret what's written, yes.

17 Q. And you've interpreted the Data Law in the most
18 conservative way possible, correct?

19 MR. LINDER: Objection.

20 THE COURT: Yeah, I'm not sure that's very helpful.
21 He's interpreted it the way he's interpreted it. So let's talk
22 about specifics rather than theories of interpretation by
23 cybersecurity experts.

24 Q. Mr. Chernoby, it's your view that because certain parts of
25 the Data Access Law are written in a vague manner you have to

1 assume the most difficult approach for compliance with these
2 terms, correct?

3 MR. LINDER: Same objection to pejorative adjectives
4 and --

5 THE COURT: I'm going to permit him to answer that,
6 but I really do want to focus on specifics rather than
7 theories. Okay? So you can answer the question.

8 A. Could you repeat the question, please.

9 Q. Sure. Mr. Chernoby, it's your view that because certain
10 parts of the Data Access Law are written in a vague manner, you
11 have to assume the most difficult approach for compliance in
12 your interpretation of those terms?

13 A. My job as compliance is to make absolutely certain that we
14 comply with the law. So when we are given a law with
15 terminology, I have to interpret it in the broadest form to
16 make sure our vehicles comply.

17 Q. And you said you have to make sure the broadest form for
18 vehicles to comply?

19 A. Yes.

20 Q. Now, it's your view that to create an open access platform
21 as required by section 3 of the law, FCA would have to remove
22 or disable access controls, correct?

23 A. Yes, that's my interpretation.

24 Q. And you believe that to create an open access platform,
25 FCA would have to remove the secured gateway from the vehicle?

1 A. In compilation with the timing of the law that's been
2 stated, we would have to remove the gateway. I have no other
3 way to provide the kind of open access that's being requested.

4 Q. Regardless of the time, though, you believe to create an
5 open access platform, FCA would have to remove the secured
6 gateway from the vehicle; is that correct?

7 A. You would have to remove the functions that the gateway
8 provides. You may be able to leave the piece of hardware
9 there, but the type of authentication, et cetera, that it does
10 would no longer be allowed.

11 Q. And you also believe that to create an open access
12 platform, FCA would have to revise all the wiring in a vehicle,
13 correct?

14 A. If you left the security gateway in the vehicle and you
15 simply removed most of its functions, you might not be able to
16 -- you might not have to revise all the wiring. It depends
17 upon the decision you made of what you wanted to do with the
18 hardware.

19 Q. Mr. Chernoby, if you look at paragraph 81 of your
20 affidavit, the second sentence says, "To give open access to
21 vehicle systems, FCA would have to remove the secured gateway
22 and revise all the wiring and software for every computer in
23 the vehicle. Is it no longer your position that FCA would both
24 have to remove the secured gateway and revise the wiring?

25 A. Well, if you remove the gateway, you would have to revise

1 the wiring, and you would have to revise the software of the
2 ECUs in the vehicle.

3 There likely could be another option. I'm not certain
4 that you could disable the gateway in some fashion. We would
5 have to study that with the supplier. And if you disabled the
6 gateway, you might be able to leave the hardware in place.

7 Q. And all of these beliefs about what FCA would have to do
8 are based on your interpretation of what the law requires,
9 correct?

10 A. Yes, that would be my assessment of the law as I read it.

11 Q. And despite all these changes that have to be made, you
12 believe that FCA could create such an open access platform,
13 correct?

14 A. Could you repeat that question.

15 Q. Despite the changes that might have to be made, you
16 believe that FCA could create such an open access platform,
17 correct?

18 A. I don't believe one could be created without imparting a
19 safety risk on the vehicle that would be untenable.

20 Q. Putting aside any other concerns, I'm just asking if it
21 could be done.

22 A. Physically could it be done, disregarding safety, yes,
23 physically it could be done disregarding safety.

24 Q. And you don't have any reason to believe that FCA couldn't
25 do the things you mentioned to create the platform?

1 A. To create -- could you repeat the question, please.

2 Q. Sure. So we talked about creating open access platform,
3 and in Paragraph 81 of your affidavit you said FCA would have
4 to remove the secured gateway, correct?

5 A. Yes.

6 Q. And FCA would have to revise all the wiring, correct?

7 A. Yes.

8 Q. And FCA would have to revise all the software, correct?

9 A. Yes.

10 Q. And you don't have any reason to believe that FCA couldn't
11 do those things, do you?

12 A. Technically, as an engineering auto company, could we
13 perform those actions? Yes. But when you ask the question
14 could we do them --

15 Q. I'm not asking for an explanation right now, please.

16 THE COURT: Just a moment. I'm going to get the
17 explanation because it's playing with words. And we've been
18 over this before. Perhaps you weren't in the courtroom, but
19 we've been over this, "could," "should," "might," "is it
20 advisable" so I'm going to permit him to respond.

21 A. When you use the word "could" we do them, then I have to
22 overlay, would the federal government allow us to take those
23 actions, and I don't believe they would. I think they would
24 force us to recall those vehicles or prevent shipment.

25 Q. And Mr. Chernoby, you think that the things that would

1 need to be done to create the platform could probably be done
2 within two years; is that right?

3 A. The physical actions we've described here, if we disregard
4 all the other elements we just talked about, could probably be
5 done in two years.

6 Q. And two years ago from now was 2019, correct?

7 A. That's correct.

8 Q. And currently FCA has not taken any steps to create this
9 type of platform; is that correct?

10 A. That is correct.

11 Q. Mr. Chernoby, another term in the Data Access Law that you
12 testified about in paragraph 78 of your affidavit is mechanical
13 data. I'll give you a minute to turn there, if you'd like.

14 THE COURT: Sorry, 78, is that it?

15 MS. FIMOGNARI: Yes, Your Honor.

16 THE WITNESS: Could I take a second to read it please.

17 MS. FIMOGNARI: Yes, you may.

18 A. Okay.

19 Q. You're aware that the Data Access Law defines mechanical
20 data to mean vehicle specific data used for or otherwise
21 related to the diagnosis, repair or maintenance of the vehicle?

22 A. That's what it states.

23 Q. And your explanation of what FCA would have to do to
24 comply with the Data Access Law is based, at least in part, on
25 your understanding of the definition of mechanical data,

1 correct?

2 A. Yes, in part I agree.

3 Q. And you believe that the term -- you believe that the
4 phrase "otherwise related to the diagnosis, repair or
5 maintenance of the vehicle" is completely open-ended, correct?

6 MR. LINDER: Objection to the characterization.

7 THE COURT: I'll let him answer.

8 A. I interpret the phrase "otherwise related to the
9 diagnosis," the term -- the two words "otherwise related," to
10 me, make it very clear that it is not only specific to
11 diagnosis, repair or maintenance of the vehicle.

12 Q. And it's completely open-ended?

13 MR. LINDER: Same objection.

14 THE COURT: I'll sustain that objection.

15 Q. Mr. Chernoby, the definition of "mechanical data,
16 including otherwise related to" doesn't just mean, in your
17 view, data related to diagnosis, repair and maintenance.
18 That's what you just said, right?

19 A. That is correct.

20 Q. And rather you think it applies to virtually any piece of
21 data?

22 MR. LINDER: Objection to the characterization of the
23 testimony.

24 THE COURT: Yeah, I am going to sustain that
25 objection. This is, I think, small bear.

1 Q. Mr. Chernoby, your understanding of the definition of
2 mechanical data is based on your interpretation of the law in a
3 conservative way, correct?

4 MR. LINDER: Same objection to the last line of
5 questioning.

6 THE COURT: Right. I think I'll sustain that
7 objection. We've got a sense of background here. So if
8 there's something more specific that we're talking about other
9 than infinitely inquiring into perspectives.

10 MS. FIMOGNARI: Yes, Your Honor.

11 Q. Mr. Chernoby, in 2015, FCA issued a voluntary recall due
12 to cybersecurity vulnerability involving the telematics system,
13 correct?

14 A. That is correct.

15 Q. And Mr. Chernoby, if you'll turn to Trial Exhibit 13 in
16 your binder.

17 A. I can see it on the screen.

18 Q. Okay. Great.

19 This is the 573 report associated with that 2015 recall,
20 correct?

21 A. That is correct.

22 Q. And a 573 report is submitted by FCA to NHTSA when FCA
23 plans to do a safety recall, correct?

24 A. That is correct.

25 Q. And this 2015 recall was done voluntarily by FCA?

1 A. That is correct.

2 Q. So FCA did not make a determination that the security
3 vulnerability constituted a defect as defined in the Motor
4 Vehicle Safety Act?

5 A. Yes, that's correct.

6 Q. And for a voluntary recall such as the 2015 one that we've
7 been discussing, FCA chooses to conduct the recall without
8 being told that they have to by the government, correct?

9 A. That is correct.

10 Q. And isn't it true that FCA has reporting obligations to
11 the EPA when there is a vehicle issue related to factors that
12 the EPA regulates?

13 A. Could you repeat that question, please.

14 Q. Sure. Perhaps I can rephrase it. FCA has reporting
15 obligations to the EPA when there is a vehicle issue related to
16 factors that the EPA regulates?

17 THE COURT: I just want to be sure, you're now on to
18 EPA obligations as distinct from --

19 MS. FIMOGNARI: Yes, we're all done with the document,
20 Your Honor.

21 THE COURT: Thank you.

22 A. The FCA has a responsibility to report to the EPA if there
23 is a field issue where it could take it out of compliance for
24 emissions or onboard diagnostics.

25 Q. But FCA did not report anything to the EPA about the 2015

1 recall based on the cybersecurity vulnerability that we were
2 just discussing, correct?

3 A. That is correct.

4 Q. And that's because the 2015 recall didn't involve any
5 factors regulated by the EPA, correct?

6 A. That is correct.

7 Q. And Mr. Chernoby, you were involved in communications with
8 NHTSA in 2015 related to this recall, correct?

9 A. That is correct.

10 Q. And FCA meets with NHTSA about every month?

11 A. That is correct.

12 Q. And you've attended at least two meetings with NHTSA about
13 cybersecurity; is that correct?

14 A. I don't recall exactly how many. I would say at least two
15 meetings with NHTSA on the subject.

16 Q. But you don't remember when those meetings occurred,
17 correct?

18 A. I don't recall specifically when they occurred.

19 Q. And you don't remember who specifically attended those
20 meetings?

21 A. No, I don't remember specifically who attended those
22 meetings.

23 Q. And you don't remember who delivered the presentations at
24 the meetings?

25 A. No, I don't recall.

1 Q. And so apart from the communications about the 2015 recall
2 and the cybersecurity meetings, you're not aware of any other
3 communications between FCA and NHTSA about cybersecurity; is
4 that correct?

5 MR. LINDER: Objection. Foundation.

6 THE COURT: We're asking what he's aware of so I'll
7 permit it.

8 A. Could you repeat that, please.

9 Q. Sure. Apart from the communications about the 2015 recall
10 that we just discussed and those cybersecurity meetings we just
11 discussed, you're not aware of any other communications between
12 FCA and NHTSA about cybersecurity, correct?

13 A. When you use the term "cybersecurity meetings," I'm aware
14 that there were at least two meetings with NHTSA after the
15 recall activity was done and basically at the request of NHTSA
16 to keep them informed of what we were doing with cybersecurity
17 practices.

18 Q. And those were the two meetings that we just discussed,
19 correct?

20 A. Yes.

21 Q. So aside from those two meetings and aside from the 2015
22 recall, you're not aware of any other communications between
23 FCA and NHTSA about cybersecurity?

24 A. No, I don't recall any other communications.

25 Q. Mr. Chernoby, if you'd turn to paragraph 69 of your direct

1 testimony.

2 A. Okay.

3 Q. You assert that, "Removing manufacturers from the process
4 removes manufacturers' ability to ensure that unauthorized
5 software, such as software that would evade emissions
6 requirements, is not installed on vehicles." Isn't that right?

7 A. Yes, that's what I stated.

8 Q. In that statement, you refer to "manufacturers" in the
9 plural. Are you referring to just FCA there?

10 A. No. At the time I was speaking broadly of an automotive
11 OEM.

12 Q. So in that paragraph 69, you were talking about all
13 vehicle manufacturers?

14 A. If you're a vehicle manufacturer, yes, I was talking about
15 an OEM in general.

16 Q. Well, let's talk about FCA then. You don't actually work
17 on software at FCA, correct?

18 A. No, ma'am.

19 Q. And software does not fall within your responsibility?

20 A. No, it does not.

21 Q. And let's look at paragraph 83 of your direct testimony,
22 please. In the first sentence of paragraph 83, Mr. Chernoby,
23 you asserted that "Disabling telematics is no solution." Did I
24 read that correctly?

25 A. You did.

1 Q. But you don't actually know the specifics of how FCA
2 telematics systems transmit data; is that right?

3 A. I know in general how they transmit data. The specifics
4 of the line code of the software, no.

5 Q. You don't know if FCA's telematics system transmits
6 information via WiFi or cellular, do you?

7 A. We can transmit from either medium, but we transmit via
8 WiFi today.

9 Q. And you don't know if FCA customers can opt to have the
10 vehicle's telematics system shut off, correct?

11 A. Could you repeat that, please.

12 Q. You don't know if FCA vehicle owners can opt to have the
13 vehicle's telematics system shut off; is that right?

14 A. There is an opt-in and opt-out that FCA customers are
15 asked to review and concur to at the point of sale.

16 Q. Mr. Chernoby, do you remember taking a deposition in this
17 case?

18 A. I do.

19 Q. And it was sometime in April?

20 A. Yes, sometime in April.

21 Q. And there was a court reporter present?

22 A. Yes, I believe there was.

23 Q. And you remember taking an oath to tell the truth at that
24 deposition?

25 A. Yes, ma'am.

1 Q. And you attempted to tell the truth, correct?

2 A. Yes.

3 Q. All right. Would you please turn to your deposition
4 transcript which is in your binder. Would you please turn to
5 page 159, line 18.

6 A. What line, ma'am?

7 Q. Page 159, we're going to be looking at line 18. So you
8 were asked the question, "Can the customer opt to just have the
9 telematics system shut off entirely?" And you answered, "I
10 don't know if they can do that or not." Did I read that
11 correctly?

12 A. You did.

13 Q. Okay. Mr. Chernoby, you're aware that FCA allows vehicle
14 owners to opt out of providing certain information via
15 telematic transmission?

16 A. I'm aware, as I said just a few seconds ago, that there is
17 an opt-in and opt-out that customers are asked to sign at a
18 point of sale.

19 Q. But it's just for some information, correct?

20 A. I don't know what information they're asked to opt in and
21 opt out of in that specific document.

22 Q. And you don't know if it's all information or just some?

23 A. I don't know what specific information, as I just said.

24 Q. Mr. Chernoby, in the second sentence of paragraph 43 of
25 your affidavit -- I'll give you a minute to turn there if you'd

1 like -- you asserted that vehicle diagnostic, repair, and
2 maintenance data is equally accessible by dealerships and
3 independent repair shops. Do you see that in the second
4 sentence?

5 A. I do.

6 Q. But you don't know if FCA dealers get different
7 information from the independent repair shops. Do you?

8 A. When you say "get different information," could you
9 describe that a little bit?

10 Q. You don't know if they get the same information as the
11 independent repair shops, do you?

12 A. What I do know, as an example, if you look at the security
13 gateway, which defines the access that these repair tools can
14 get, the same access points are defined for both the dealership
15 and an independent repair shop. It is the same list.

16 Q. Okay. So it's the same information is what you're saying
17 that they receive?

18 A. Yeah, the same diagnostic ability for data that goes
19 across the gateway is exactly the same. I don't know what
20 other written information these entities might get, but I do
21 know the diagnostic tools and the gateway have exactly the same
22 clearances for both the third-party tool and the dealer tool.

23 Q. And with those clearances, the FCA dealers get the same
24 information as the independent repair shops. That's what
25 you're saying?

1 A. Through those tools, correct.

2 Q. Mr. Chernoby, would you turn to page 105 of your
3 deposition, please.

4 A. You're already there. Okay.

5 Q. And do you see at line 21 you were asked the question, "So
6 you don't know, sitting here today, if the franchise dealers
7 get different information from the independent repair shops?"
8 And after an objection, you said, "Yeah, I don't know." Did I
9 read that correctly?

10 A. Yes, you did.

11 Q. Mr. Chernoby, in paragraph 45 of your direct testimony,
12 you testified about FCA's cybersecurity controls around vehicle
13 systems?

14 THE COURT: To avoid the problem of completeness, I
15 take notice of the following question and answer.

16 MS. FIMOGNARI: I'm sorry, Your Honor?

17 THE COURT: To deal with the problem of completeness
18 in bringing that to his attention, I also take notice of the
19 following question and answer which clarify this line of
20 attack.

21 MS. FIMOGNARI: Thank you, Your Honor.

22 Q. So Mr. Chernoby, in paragraph 45 of your direct testimony,
23 you testified about FCA's cybersecurity controls around vehicle
24 systems, correct?

25 A. Yes.

1 Q. And you testified in the first sentence of that paragraph
2 that FCA's cybersecurity controls are, quote, "highly
3 interdependent and multilayered," end quote; is that right?

4 A. That's correct.

5 Q. And then in the next paragraph you list some of these
6 cybersecurity controls; is that right?

7 A. That's correct.

8 Q. And the first thing you list as a cybersecurity control in
9 paragraph 45 is "Identity certificates exchanged between
10 vehicle systems (client) and servers." Do you see that?

11 A. Yes.

12 Q. But you have not done any work on identity certificates,
13 correct?

14 A. I don't -- you're asking me if I specifically set up the
15 identity certificates?

16 Q. I'm asking if you've done any work on identity
17 certificates.

18 MR. LINDER: Objection. Vague as to "any work on."

19 THE COURT: Yes, I think if it's has he done any work
20 concerning them, I'll permit that answer, that question which
21 is, as they say, open-ended.

22 Q. You have not done any work concerning identity
23 certificates, correct?

24 A. I will respond to the question based on describing what I
25 have been involved in.

1 Q. Yes or no, sir.

2 THE COURT: No, it's not a yes or no question. That's
3 the problem with it. So now you're going to get the answer
4 that you asked for.

5 Q. I asked, you have not done any --

6 THE COURT: If I may, I'm going to permit him to
7 answer the question the way that he wishes to answer the
8 question.

9 A. What I have been involved with is working with a direct
10 report of mine, setting up the cybersecurity design practices,
11 the protocol, and identity certificates were a part of that.
12 And then once we had established those requirements, we handed
13 them to the engineering team and the supply base and
14 information technology from the offboard connections, and they
15 executed the details.

16 Q. Mr. Chernoby, would you turn to page 145 of your
17 deposition transcript, please.

18 A. I'm at 145.

19 Q. Okay. On line 6 you were asked the question, "Do you do
20 any work with identity certificates?" After an objection, you
21 said, "I don't have any specific work I did on identity
22 certificates." And then you were asked the question, "Who do
23 you know at -- well, does anyone who reports to you do work on
24 identity certificates?" And you answered, "Not that I'm aware
25 of, no." Did I read that correctly?

1 A. You did.

2 Q. All right. Returning to paragraph 45 of your affidavit,
3 Mr. Chernoby.

4 A. Page 45, ma'am?

5 Q. In your affidavit, your direct testimony, paragraph 45,
6 please. And I'll give you a minute.

7 A. All right. I see it. Thank you.

8 Q. Another cybersecurity control you specify in paragraph 45
9 is something called secure boot, correct?

10 A. That's correct.

11 Q. Isn't it true that you don't actually know what the term
12 "secure boot" means?

13 A. No. I understand in general what the term "secure boot"
14 means.

15 Q. Mr. Chernoby, would you turn to page 146 of your
16 deposition testimony, please.

17 A. Okay. You're already there.

18 Q. On line 3 you were asked the question, "What is secure
19 boot?" And you answered, "I don't remember what the term
20 means." Did I read that correctly?

21 A. You did.

22 Q. Okay. Mr. Chernoby, returning to paragraph 45, that list
23 of cybersecurity controls, another term that you use in that
24 paragraph is asymmetric cryptographic digital image signing.
25 Do you see that?

1 A. I do.

2 Q. Isn't it true that you don't know what asymmetric
3 cryptographic digital image signing is?

4 A. I have a general understanding of what it means.

5 Q. All right. Mr. Chernoby, would you turn to page 147 of
6 your deposition, please.

7 A. Okay.

8 Q. On line 20, and it's going to go on to the next page, you
9 were asked, "Do you know what asymmetric cryptographic digital
10 image signing is?" And then after an exchange to determine
11 where exactly in your pretrial declaration the term was used,
12 if you go down to line 9, you said, "No, I don't know what that
13 is." Did I read that correctly?

14 A. You did.

15 THE COURT: What's the document to which he was
16 referring at that time? Understanding, of course, that these
17 terms are used in different ways in different circumstances and
18 we're spending a great deal of time on something that's not so
19 productive. But that having been said, what is the document
20 that was being used at that time?

21 MS. FIMOGNARI: It was Mr. Chernoby's pretrial
22 declaration, which is included in the cross-examination binder
23 at -- it's labeled --

24 THE COURT: It's not an exhibit?

25 MS. FIMOGNARI: No, Your Honor, but it was filed in

1 the case.

2 THE COURT: Okay. All right. I understand.

3 Q. Mr. Chernoby, the responsibilities of your position at FCA
4 include making sure that FCA vehicles meet federal motor
5 vehicle safety standards, correct?

6 A. Yes. Our responsibility is to certify -- we self-certify
7 with NHTSA that the vehicles meet those requirements.

8 Q. And the federal motor vehicle safety standards set forth
9 criteria for tests that FCA's engineering department runs,
10 correct?

11 A. That is correct.

12 Q. And then FCA's engineers prepare a compliance report for
13 each specific requirement of a motor vehicle safety standard,
14 correct?

15 A. That's correct.

16 Q. And then your team reviews the compliance report for the
17 federal motor vehicle safety standard?

18 A. That is correct.

19 Q. You're not aware of any federal motor vehicle safety
20 standards that apply to cybersecurity, correct?

21 A. That's correct.

22 Q. Mr. Chernoby, before FCA sells a vehicle, it must obtain
23 an emissions certification from EPA, correct?

24 A. That is correct.

25 Q. And these emissions certifications certify that the

1 vehicle is compliant with EPA regulatory requirements?

2 A. That is correct.

3 Q. And these certifications include data from the EPA
4 prescribed emissions tests that we just talked about?

5 A. That is correct.

6 Q. And they demonstrate FCA's compliance with EPA's emissions
7 standards, correct?

8 A. That is correct.

9 Q. If a vehicle does not comply with EPA's emissions
10 standards, FCA won't be granted a certificate, correct?

11 A. Yeah. I can't speak on behalf of the EPA, but yes, that
12 is the process.

13 Q. And FCA has obtained emissions certifications from EPA in
14 the past on vehicles that don't have a secured gateway,
15 correct?

16 A. That is correct.

17 Q. And there are no EPA regulations that relate to
18 cybersecurity?

19 A. Not that I'm aware of.

20 Q. So it's fair to say that FCA did not implement its secured
21 gateway to comply with an EPA regulation?

22 MR. LINDER: Objection. Misstates testimony.

23 THE COURT: No. He can answer that question.

24 A. Could you repeat the question, please.

25 Q. So it's fair to say that FCA did not implement its secured

1 gateway to comply with an EPA regulation, correct?

2 A. That's correct.

3 Q. Returning to your affidavit, Mr. Chernoby, in paragraph
4 74, I'll give you a minute to get there.

5 A. Okay. She's there on the screen.

6 Q. So in the fifth sentence of that paragraph, you testified,
7 "When FCA contracts with a third party like AutoAuth to allow
8 authenticated repair shops to get past the secured gateway and
9 access the vehicle, those authenticated repair shops are given
10 access to the data required to diagnose and repair the
11 vehicle." Did I read that correctly?

12 A. That's what it says, yes.

13 Q. Mr. Chernoby, you don't know what AutoAuth is, correct?

14 A. I do understand it's an entity, basically a marketing
15 term, if you will, of what we interface with between the repair
16 shops and us.

17 Q. Mr. Chernoby, would you please turn to page 112 of your
18 deposition transcript, please.

19 A. Okay.

20 Q. On line 18, you were asked the question, "I'll repeat it
21 and I'll spell it. Do you know what the AutoAuth system is?
22 Spelled Auto, a-u-t-o, Auth is a-u-t-h," and you answered,
23 "No." Did I answer that question correctly -- did I read that
24 correctly? Excuse me.

25 A. You read that correctly.

1 Q. Returning to your affidavit, Mr. Chernoby, in paragraph --

2 THE COURT: So I understand what's happening here,
3 he's being impeached in the deposition by his December
4 affidavit in this case; is that right? That's what you're
5 referring to when you go through the evaluation of the
6 definitions?

7 MS. FIMOGNARI: In this section, Your Honor, he was
8 just being asked generally about the term. The declaration was
9 not at issue.

10 THE COURT: Okay. And so there was not before him and
11 hadn't been prepared at that time the declaration that's in
12 evidence in this case concerning his testimony. So this is
13 meant to impeach him as he must have learned something between
14 April 9 and whenever it was that you filed the trial
15 declaration. Is that the purpose for which it's being offered?

16 MS. FIMOGNARI: Yes, Your Honor.

17 THE COURT: Okay. And with respect to the previous
18 ones, when I asked about what document he was referring to,
19 whether he was referring to his declaration or the declaration
20 submitted on his behalf, on his part, in December in this case.

21 MS. FIMOGNARI: Yes, Your Honor.

22 THE COURT: Okay. So that's different kind of
23 definitional issues which may or may not go to the question of
24 whether or not he got himself up to speed on those definitions.
25 Is that what it's being used for?

1 MS. FIMOGNARI: Yes, Your Honor. He didn't have the
2 knowledge at the time.

3 THE COURT: All right.

4 Q. So if we could return to your affidavit, Mr. Chernoby, I'd
5 like to look at paragraph 86, please. And in paragraph 86 of
6 your affidavit you state that, "Attached to this affidavit are
7 true and correct copies of the following trial exhibits, which
8 were produced from FCA's records." Do you see that?

9 A. I do.

10 Q. And do you see that the first document listed in paragraph
11 18 is Trial Exhibit 8, Bates number AAI-FCA-111090 to 111094
12 and 111095?

13 A. Yes, I see that's what it says.

14 Q. And that's a June 2020 engineering requirements document
15 titled "Diagnostic Services Secure Access Rights"?

16 A. Yes, that's what it states.

17 Q. All right. Mr. Chernoby, would you turn to Trial Exhibit
18 8 in your binder, please.

19 A. Okay.

20 Q. Do you recognize this document?

21 MR. LINDER: Your Honor, I just want to note for the
22 record these are documents that you admitted as business
23 records, and I'd ask to affiliate them with a witness.

24 THE COURT: I mean, perhaps there's a basis for
25 inquiry but the basis for inquiry is whether or not he fully

1 understands these exhibits as business records.

2 MS. FIMOGNARI: I'm probing his knowledge about the
3 documents, Your Honor.

4 THE COURT: Well, we can probe knowledge about lots of
5 things, but using this document is not necessarily the proper
6 way to do it.

7 MS. FIMOGNARI: Okay.

8 THE COURT: I mean, I view these tagalongs precisely
9 as described, that somebody had to sponsor them, so he sponsors
10 them. That doesn't mean he necessarily absorbed all the
11 information in it. If there's something else beyond them,
12 that's a different issue.

13 MS. FIMOGNARI: Thank you, Your Honor.

14 Q. We don't need to look at the document anymore,
15 Mr. Chernoby.

16 A. Okay.

17 Q. Mr. Chernoby, isn't it true that FCA contributed millions
18 of dollars to the campaign in opposition to the Data Access
19 Law?

20 A. I don't recall specifically what FCA might have
21 contributed to the Data Access Law discussion with AAI.

22 Q. Mr. Chernoby, would you turn to page 223 of your
23 deposition transcript, please.

24 A. Yes. 223?

25 Q. Yes.

1 A. Okay.

2 Q. And do you see on line 23 you were asked the question, "Do
3 you know how much FCA contributed to the opposition campaign?"
4 You answered, "No, I don't specifically -- what we ended up
5 contributing"?

6 MR. LINDER: Your Honor, she's impeaching with a prior
7 consistent statement. This isn't proper impeachment.

8 THE COURT: I understand. And furthermore, I'm not
9 sure what the significance is. Let me -- I haven't gone back
10 to look at the financial reporting, but is there financial
11 reporting with respect to the contributors to Alliance Auto
12 Innovation?

13 MS. FIMOGNARI: I'm not sure, Your Honor.

14 THE COURT: So frankly, he doesn't know what their
15 lobbying people were doing. That's what he says. That what he
16 said here. That's what he says there. What's the significance
17 of that?

18 MS. FIMOGNARI: If I may, Your Honor, the next section
19 I was going to read he does specify the amount. So I was just
20 reading two questions.

21 THE COURT: So what? I mean, at the end, so what?
22 You know, that it is a matter of significance to automobile
23 manufacturers that they ginned up enough money to raise a
24 defense in the recall is about as significant, to me, as
25 whether the other side did the same thing. I'm not sure --

1 it's just not relevant to what's before me.

2 MS. FIMOGNARI: But if --

3 THE COURT: Let me finish, and then you can respond.
4 We have a recall. Okay. That's a rather unique kind of
5 activity and people get to make direct contributions. Those
6 who are interested get to make direct contributions and they
7 did apparently, and apparently lots of money was spent on this
8 one. That's all I know. But beyond that background, I don't
9 think it's relevant to my determination about preemption. Is
10 it who spends more money or whose subordinates know about how
11 much money they spent on it? Is that the relevance?

12 MS. FIMOGNARI: No, Your Honor. It goes to the issue
13 of bias, and if I may --

14 THE COURT: Bias? You know, I really have no -- tell
15 you what, you win on bias.

16 MS. FIMOGNARI: Thank you, Your Honor.

17 MR. LINDER: Your Honor, I would object to that, but I
18 understand.

19 MS. FIMOGNARI: Your Honor, if I may, we allowed
20 evidence in as to the other side's financial contributions.

21 THE COURT: "We" didn't.

22 MS. FIMOGNARI: I'm sorry. Your Honor did. Excuse
23 me, I'm sorry.

24 THE COURT: I did. And I also made clear, I think
25 there that those of us in Casa Blanca are not shocked. On that

1 basis, I let it in. I think I quote myself directly on that.
2 So I just want to -- yes, this is -- you know, somebody who is
3 interested in good government or maybe effective government
4 might say how are we letting these major players in a
5 particular area spend all kinds of money to pass a particular
6 piece of legislation not fully reticulated as a result of a
7 fully developed legislative record, we might ask that. Someone
8 might ask that, maybe somebody in political science might ask
9 that. That's not my question.

10 My question is whether or not it is unconstitutional
11 on preemption grounds. So that's why I'm limiting it. I, of
12 course, have to take into consideration the larger background.
13 So I'm not sure that there's much more to get out of this, but
14 if you think there is --

15 MS. FIMOGNARI: May I just briefly respond?

16 THE COURT: Sure. No, no. Don't ask me. Ask him,
17 and then I'll rule on the objection if it arises.

18 MS. FIMOGNARI: Okay.

19 Q. So I was in the middle of reading the impeachment. I will
20 continue reading from deposition transcript page 223, and I had
21 started on line 23. And now I'm saying, you were asked, "Was
22 it within the range of 2.2 million to 4 million?" And you
23 answered, "Yeah, I just don't -- I don't remember. It was
24 millions. I remember that. But I don't remember exactly what
25 the number was."

1 MR. LINDER: Your Honor --

2 Q. Did I read that correctly?

3 MR. LINDER: -- again, improper impeachment with prior
4 consistent statement that he doesn't remember under 613.

5 THE COURT: Well, and so negligibly relevant as to be
6 excluded on 403 grounds as well. I mean, is that what it was
7 supposed to be? That's the impeachment?

8 MS. FIMOGNARI: Yes, Your Honor. He says it was
9 millions.

10 THE COURT: Okay. No. I see he did. So I'm going to
11 exclude it.

12 MS. FIMOGNARI: Yes, Your Honor. Thank you.

13 Q. Mr. Chernoby, aside from meetings with your legal counsel,
14 you haven't attended any meetings at FCA about the Data Access
15 Law, correct?

16 A. When you say "about the Data Access Law," I have had
17 discussions prior to AAI engaging about the general topic, but
18 internal meetings about the law, no.

19 Q. And you haven't met with any engineers to discuss the Data
20 Access Law?

21 A. No, no discussions about the law.

22 Q. The only person at FCA you remember having a conversation
23 with about the law is Shane Carr, correct?

24 A. As we developed our input to AAI, yes, it was Shane Carr.

25 Q. And Shane Carr is the head of government regulations for

1 FCA?

2 A. That's correct.

3 Q. And you have not been involved in any FCA efforts to try
4 to comply with the Data Access Law, correct?

5 A. No.

6 Q. And FCA has not done anything to begin to implement the
7 Data Access Law requirements, correct?

8 MR. LINDER: Objection. Foundation.

9 THE COURT: I'll sustain the objection.

10 Q. Mr. Chernoby, you're not aware of FCA doing anything to
11 begin to implement the Data Access Law requirements?

12 THE COURT: Really, I can't make this clear enough. I
13 have blocked out time for productive examination, and this is
14 low productivity. So if there's some productive things that
15 you want to get to, go ahead. But this has happened
16 throughout, and I've done it with counsel on both sides, and
17 I'll continue to do it because I don't want to spend extra time
18 when it's so obvious what this witness's capacities are and
19 what the company has done from his perspective.

20 Now, it may be that somebody didn't call the right
21 experts to tell all the things that FCA did. It may be that
22 FCA and GM and the industry has a consistent pattern of
23 whistling past the graveyard. Who knows. But this much I want
24 to be sure everyone understands is I want relevant and material
25 evidence from the witnesses who are called here, and I don't

1 want to waste time doing a deep dive into dictionaries like
2 "on" and "regarding" and "to" and that sort of thing.

3 So do you have something else that you'd like to
4 explore?

5 MS. FIMOGNARI: Yes, Your Honor.

6 THE COURT: Okay.

7 Q. Mr. Chernoby, FCA currently uses a secured gateway in all
8 its vehicle models in the U.S., correct?

9 A. That's correct.

10 Q. And FCA began introducing the secured gateway in vehicles
11 in 2017, correct?

12 A. Calendar year, that is correct.

13 Q. And you were involved in seeking approval for the capital
14 investment for the secured gateway?

15 A. That is correct.

16 Q. And the capital investment was more than \$50 million,
17 correct?

18 A. That is correct.

19 Q. Mr. Chernoby, would you turn to Trial Exhibit 23 in your
20 binder, please.

21 A. You said 23? Okay, go ahead. I see it.

22 Q. And Mr. Chernoby, this is an email and a PowerPoint
23 attachment that were sent to you. Do you see that?

24 A. Yeah, I do see the very top email doesn't appear to have
25 me on the distribution, but below I'm noted, yes.

1 Q. Yes. So if you go to the third email on the first page,
2 dated March 3, 2020 at 11:10 a.m., it was sent to you, correct?

3 A. That is correct.

4 Q. If you go to page 5 of the exhibit where the PowerPoint
5 begins, you see the title page?

6 A. I do.

7 Q. And it's dated February 26, 2019, correct?

8 A. It is.

9 Q. Now, if we turn to the third slide of this presentation,
10 the title is, "Potential Risks to FCA if Enacted," correct?

11 A. That's correct.

12 Q. The first category on this page is titled, "Potential
13 Financial Risks," correct?

14 A. That's correct.

15 Q. And the third bullet under that category reads, "FCA's
16 secured gateway would be incompatible with ACA's proposed
17 solution, putting the significant investments made in the SGW
18 at risk." Did I read that correctly?

19 MR. LINDER: Your Honor, I'm not sure what the basis
20 of this line of questioning is, but this document, he didn't
21 write. It's not proper impeachment. He said how much he spent
22 on it. If there's --

23 THE COURT: Well, you know --

24 MS. FIMOGNARI: Your Honor, I'm not attempting to
25 impeach him. I'm asking him about the document.

1 THE COURT: Well, are you going to ask him about every
2 document that's come in in this case just to see what he
3 thinks?

4 MS. FIMOGNARI: No, Your Honor. I have about two more
5 questions, Your Honor.

6 THE COURT: That's good, but I deal with it question
7 by question. And so this is to ask him about a document that
8 you say he really didn't have anything to do with, except that
9 apparently he was on a list.

10 MS. FIMOGNARI: He received it, yes.

11 THE COURT: And to establish that there was a
12 financial interest as well in FCA not taking further steps to
13 embrace ACA's proposed solution. Is that it?

14 MS. FIMOGNARI: In part, Your Honor.

15 THE COURT: Well, that seems about the only part
16 that --

17 MS. FIMOGNARI: It also goes to the secured gateway,
18 which is mentioned here.

19 THE COURT: It goes to the secured gateway. That one
20 doesn't.

21 MS. FIMOGNARI: Yes. Excuse me, Your Honor, it says
22 "FCA's secured gateway would be incompatible with ACA's
23 proposed solution."

24 THE COURT: Right.

25 MS. FIMOGNARI: So that was talking about the secured

1 gateway, Your Honor.

2 THE COURT: Okay. Well, if you want to explore with
3 him what he knows about the FCA's secured gateway being
4 incompatible with the proposed solution, that's fine. The
5 proposed investment or significant investment seems a little
6 bit attenuated. But, you know, I really do want to get to the
7 core of the case, and this is perhaps somewhat distracting.

8 Q. Mr. Chernoby, so FCA's assessment at the time was that
9 FCA's secured gateway, which costs over \$50 million to deploy,
10 is incompatible with the Data Access Law, correct?

11 MR. LINDER: Again, Your Honor, objection. He didn't
12 write this document.

13 THE COURT: I know, I know. I'm going to permit the
14 answer, but this is pretty much it. There are only two
15 questions. That's the second one.

16 A. The assessment of our government relations team at the
17 time, that's what it states.

18 MS. FIMOGNARI: Thank you. No further questions,
19 Mr. Chernoby.

20 THE COURT: So we're at the break now. I don't see a
21 reason for any kind of further examination of Mr. Chernoby.
22 But I do want to recognize that we're moving along a little bit
23 more briskly than had been anticipated, but I think more or
24 less productively we're going on to experts. And while that
25 may have accelerated things faster than, say, a seven-year

1 period for development, I do want the experts to or people to
2 be directing the experts even now to the statement of interest
3 of the United States here which did, in fact, deal with some of
4 these issues in a somewhat Delphic manner. But the kind of
5 bottom line statement periodically expressed throughout is that
6 if in practice the Data Law's requirement of remote access to
7 vehicles' telematics systems create a safety issue constituting
8 a defect under the safety act, then that act would require
9 motor vehicle manufacturers to recall and stop selling new
10 vehicles compliant with that requirement.

11 So I would assume that the experts are going to be
12 able to respond to that. I understand that that's a relatively
13 recent formulation that may not have involved preparation of
14 experts on either side, but it's obviously something I'm
15 interested in as another way of getting insight into whether or
16 not we've got conflict between the rather complex, I have to
17 say, regulatory regime that NHTSA creates.

18 So perhaps over lunch you'll talk to Mr. Bort and
19 Mr. Garrie because we may get to both of them today. Okay?
20 And similarly I hope there will be some cross-examination, I
21 suspect there will be, on that subject.

22 MR. LINDER: Your Honor, will we pick up redirect of
23 Mr. Chernoby after the break?

24 THE COURT: No, because there isn't going to be any.

25 MR. LINDER: Fair enough, Your Honor.

1 THE COURT: All right. So we'll move on to the other
2 witnesses after the break.

3 So we'll be back here at 1:15.

4 (Recess taken, 12:50 p.m. - 1:26 p.m.)

5 THE CLERK: All rise. Please be seated.

6 THE COURT: One thing that -- excuse me. One thing
7 that Ms. Beatty mentioned is we still have people on Zoom but
8 still have confidentiality, and I guess my thought about this,
9 unless the parties disagree or there's somebody who just likes
10 to watch silent movies, I think I would get on and simply say
11 we're not going to have Zoom proceedings any longer because we
12 have -- today, because we're continuing with confidential
13 materials, and so we'll take it down.

14 MR. HASKELL: I think for the rest of the day that
15 fits our view of what we expect to happen.

16 THE COURT: Yeah, I don't see the fine tuning on that
17 confidentiality taking place here during this time period.

18 If there's an objection, I understand that, or I'll at
19 least entertain it.

20 (No response.)

21 THE COURT: Okay. So what I'm going to do is ask
22 Ms. Beatty to put us not in a confidential setting; I'm simply
23 going to report where we are.

24 (Discussion off the record.)

25 THE COURT: So as I indicated to counsel earlier, it

1 appears that we're going to be continuing, as we have earlier
2 this morning, in dealing with matters that have been deemed
3 confidential. At least at this point, of course the question
4 of confidentiality will be reviewed in connection with the
5 transcripts here and later proceedings. But rather than keep
6 people on the Zoom when they're not going to be able to hear
7 anything in the case, I've decided that we'll terminate the
8 Zoom opportunities in this case for today. We'll reconsider it
9 tomorrow morning when we continue in the matter

10 (Pause.)

11 THE COURT: Are we ready for Mr. Bort?

12 MR. LINDER: Yes, Your Honor. At this point -- at
13 this time, the plaintiffs would call Bryson Bort to the
14 stand --

15 THE COURT: All right.

16 MR. LINDER: -- and ask that the Court receive into
17 evidence his affidavit.

18 THE COURT: Yes, it's received on the same
19 understandings about objections that have been made more
20 general on the record.

21 MR. LINDER: Thank you, Your Honor.

22 MR. HASKELL: Thank you, Your Honor.

23 BRYSON BORT, sworn.

24 THE CLERK: Please state your full name and please
25 spell your last name.

1 THE WITNESS: Bryson Sheridan Bort, B-o-r-t.

2 MR. HASKELL: Your Honor, I've previously handed up
3 and distributed to plaintiff's counsel a binder containing
4 materials that may come up during this cross-examination.

5 THE COURT: All right.

6 You may proceed.

7 CROSS-EXAMINATION BY MR. HASKELL:

8 Q. Good afternoon, Mr. Bort. It's good to see you again.

9 I want to start by talking about hackers.

10 Hackers can simply mean security researchers; is that
11 right?

12 A. Yes, sir.

13 Q. And you had --

14 THE COURT: Mr. Bort, if you could get closer to the
15 microphone so that everyone --

16 THE WITNESS: Is that better, sir?

17 THE COURT: Yes, that's better.

18 BY MR. HASKELL:

19 Q. You would describe yourself as a hacker, wouldn't you?

20 A. Yes, sir.

21 Q. In the vein of hackers, you know of a fellow named Charlie
22 Miller; is that right?

23 A. Yes, sir.

24 Q. And a fellow named Chris Valasek?

25 A. Yes, sir.

1 Q. And those are the fellows who hacked that Jeep back in
2 2015; is that right?

3 A. Yes, sir.

4 Q. And that's -- I believe were you in the courtroom earlier
5 this morning, that's the same hack that the Court previously
6 heard a bit of testimony about; is that right?

7 A. Yes, sir.

8 Q. In fact, you testify about the Miller-Valasek 2015 hack in
9 your trial testimony, correct?

10 A. Yes, sir.

11 Q. I believe it's paragraph 23 of your trial affidavit.
12 You'll find a copy of it in your binder there; I believe it's
13 the first tab.

14 You testified that the Miller-Valasek hack is an
15 example of a fully remote hack; is that correct?

16 A. Yes, sir.

17 Q. And you're familiar with the details of the Miller-Valasek
18 hack, yes?

19 A. Yes, sir.

20 Q. And specifically, you're familiar with the level of
21 physical access that Mr. Miller and Mr. Valasek had to the
22 vehicle that they hacked back in 2015; is that right?

23 A. Yes, sir.

24 Q. You're aware that Miller and Valasek actually had physical
25 access to that vehicle prior to the time that they did the

1 hack; is that right?

2 A. Yes, sir.

3 Q. And you're also aware that Mr. Miller and Mr. Valasek had
4 physical access to that vehicle at the time they did the hack;
5 is that right?

6 A. Yes, sir.

7 Q. You know Craig Smith, right?

8 A. Yes, sir.

9 Q. And Craig Smith is the same gentleman -- perhaps you saw
10 him sitting in the first row of the courtroom here earlier
11 today?

12 A. We -- caught up briefly.

13 Q. Oh, good, good.

14 So you're familiar with Craig Smith's work; is that
15 right?

16 A. Yes, sir.

17 Q. And you're familiar with his writings, specifically the
18 car hackers handbook?

19 A. Yes, sir.

20 Q. And in your view, Craig Smith has a good reputation in the
21 industry; isn't that right?

22 A. Yes, sir.

23 Q. You respect Craig's contributions to automotive
24 cybersecurity, yes?

25 A. Yes, sir.

1 Q. In particular, you respect the way that Craig Smith helped
2 cause OEMs to take cybersecurity seriously; isn't that right?

3 A. Yes, sir.

4 Q. And Craig Smith started doing that at a time that OEMs
5 weren't taking cybersecurity all that seriously; isn't that so?

6 A. Yes, sir.

7 Q. In fact, you think of Craig Smith as a peer; isn't that
8 correct?

9 A. Yes, sir.

10 Q. And you would describe him as a fellow expert; is that so?

11 A. Yes, sir.

12 Q. Now, you testify in your affidavit in this case -- it's
13 paragraph 103 on page 31, if you want to take a look at it --
14 you testify that internet connected OBD dongles have
15 historically been a significant risk. Do you see that there?

16 A. Yes, sir.

17 Q. And just a dongle, to your understanding, is a plug-in to
18 the OBD port; is that correct?

19 A. Yes, sir.

20 Q. And when you speak about internet-connected dongles,
21 you're speaking about a plug-in that itself has the ability to
22 wirelessly communicate off the vehicle; is that correct?

23 A. Yes, sir.

24 Q. And in support of your view about the risks of OBD
25 dongles, you cite research by Corey Thuen and the University of

1 California at San Diego, among others. Do you see that in
2 paragraph 103?

3 A. I do, and I also know Corey personally.

4 Q. Now --

5 THE COURT: Mr. Bort, just so you're clear, because
6 we've been talking about this a bit, just answer the question;
7 and if someone wants to know if you know somebody, they'll ask
8 about that, okay?

9 THE WITNESS: Yes, Your Honor.

10 MR. HASKELL: Thank you.

11 BY MR. HASKELL:

12 Q. Now, you prepared a pair of expert reports in connection
13 with your work on this case; is that right?

14 A. Yes, sir.

15 Q. And do you remember the second one was your rebuttal
16 report, correct?

17 A. Yes, sir.

18 Q. And in your rebuttal report, you cited two sources for the
19 proposition that research by Corey Thuen and UCSD has found
20 significant security weaknesses; is that correct? Do you
21 remember that?

22 A. Yes, sir.

23 Q. One of those sources was an article by Kelly Jackson
24 Higgins that appeared on something called www.darkreading.com.
25 Do you remember that?

1 A. Yes, sir.

2 Q. And that article was published in January of 2015; is that
3 correct?

4 A. Yes, sir.

5 Q. The other source you cite for that proposition was an
6 article by Chris King that appeared on www.kb.cert.org; do you
7 remember that?

8 A. Yes, sir.

9 Q. And that article was dated in August of 2015; is that
10 correct?

11 A. Yes, sir.

12 Q. It's not your opinion that automotive cybersecurity has
13 remained static since 2015, is it?

14 A. That is correct.

15 Q. That's not your opinion?

16 A. That is not my opinion.

17 Q. Now, you also testify in -- we're looking at paragraph 109
18 of your affidavit, this is page 33, paragraph 109, you testify
19 about the secure vehicle initiative; is that correct?

20 A. Yes, sir.

21 Q. And you're aware, sir, that SVI, secure vehicle
22 initiative, consists of three ISO standards; is that right?

23 A. Yes, sir.

24 Q. And ISO standards are actually documents, aren't they?

25 A. Yes, sir.

1 Q. In fact, they're pretty thick documents; is that correct?

2 A. On average, I believe one of the ISO documents that you're
3 referencing here was not that long, but, yes, they usually are
4 pretty dense.

5 Q. And so we're talking, like, 50, a hundred pages, give or
6 take, is in the ballpark for an ISO standard?

7 A. In this case, yes.

8 Q. Now, the three standards that form SVI, one is ISO 21177.
9 At the time you formed your opinions that you set forth in your
10 testimony, you hadn't read ISO 21177, had you?

11 A. That is correct.

12 Q. ISO 21184, at the time you formed your opinions that you
13 testified to in this case, you hadn't read ISO 21184 either,
14 had you?

15 A. That is correct.

16 Q. You hadn't read it?

17 A. I had not read it.

18 Q. And ISO 21185, at the time you formed the opinions that
19 you testified to in this case, you hadn't read ISO 21185
20 either; is that correct?

21 A. That is correct.

22 Q. And in connection with your testimony about SVI, you also
23 testify about two aspects of the security credentialed
24 management system; is that correct?

25 A. That is correct.

1 Q. And for reference, if you want to take a look at it, this
2 is paragraph 112, it begins on page 33, goes over to page 34 of
3 your affidavit.

4 Specifically, you testify that two aspects of the
5 Security Credential Management System, or SCMS, require more
6 research; isn't that right?

7 A. That is correct.

8 Q. One of those aspects is misbehavior detention and
9 certificate revocation, yes?

10 A. Yes, sir.

11 Q. And the other is initial enrollment and provisioning,
12 correct?

13 A. Yes, sir.

14 Q. And your basis for testifying that those aspects require
15 more research is a PowerPoint presentation; is that correct?

16 A. Yes, sir.

17 Q. Now, specifically, the PowerPoint presentation that you
18 cite in paragraph 112 of your testimony, yes?

19 A. Yes, sir.

20 Q. And you found that PowerPoint presentation on the
21 internet; is that correct?

22 A. That is correct.

23 Q. And you found that PowerPoint presentation just recently;
24 isn't that right?

25 A. I'm not sure about that.

1 Q. Let me ask a better question.

2 You found that PowerPoint presentation last month; is
3 that correct?

4 A. I don't know if I had seen it before or not. I do know
5 that in putting together my report for this case I found it for
6 reference.

7 Q. And you -- you found it after you received the Attorney
8 General's experts' reports in this case; is that correct?

9 A. Yes, sir.

10 Q. And you found it in connection with doing further research
11 to work up your rebuttal to the Attorney General's expert
12 reports; is that correct?

13 A. Yes, sir.

14 Q. And prior to last month, I should say prior your work on
15 your rebuttal report, your only exposure to the Security
16 Credential Management System came through news articles and
17 presentations and talks; isn't that correct?

18 A. That is correct.

19 THE COURT: What was the last -- presentations and --
20 I'm sorry.

21 MR. HASKELL: Articles, presentations, and talks.

22 THE COURT: Talks, I'm sorry.

23 Go ahead.

24 BY MR. HASKELL:

25 Q. In fact, you don't recall speaking with anybody who was

1 personally involved in the development of SCMS; isn't that
2 right?

3 A. Yeah, I don't -- I don't think I had any one-on-one
4 conversation, but most likely they would have been the ones
5 presenting.

6 Q. So the PowerPoint presentation that's cited in
7 paragraph 112 of your affidavit, that's dated in March of 2019;
8 is that correct?

9 A. Yes, sir.

10 Q. And you don't know whether any research on the two topics
11 you identified has occurred since March of 2019; isn't that
12 correct?

13 A. At the time that I wrote my report?

14 Q. At the time that you formed the opinions that you
15 testified to in this case, you weren't aware of whether any
16 further research had been done on those two topics?

17 THE COURT: Just because chronology is going to be
18 important, I want to understand whether this was in connection
19 with the preparation of expert reports but before the
20 preparation of the court filings. So maybe you can clarify if
21 you ask those kinds of questions about how his developing
22 understanding took place.

23 MR. HASKELL: Sure thing.

24 BY MR. HASKELL:

25 Q. So at the time that you formed the opinions that you've

1 set forth in the rebuttal report that you signed, you didn't
2 know whether any research on those two topics about SCMS had
3 occurred since 2019; is that correct?

4 A. Yes, sir.

5 Q. Now, you also -- you also testify about the feasibility of
6 disabling vehicles telematic systems; is that right?

7 A. Yes, sir.

8 Q. And specifically you testify that -- this is paragraph 99
9 of your affidavit on page 1 -- you testify that before making
10 widespread changes, a risk assessment is necessary; is that
11 correct?

12 A. Yes, sir.

13 Q. And you testify that it's necessary to fully understand
14 the potential consequences; is that right?

15 A. Yes, sir.

16 Q. You haven't conducted such a risk assessment as part of
17 your work on this case, have you?

18 (Pause.)

19 A. I believe I have, yes, sir.

20 Q. Let's take a look at the features that you testify that
21 would be impacted by disabling a telematics system, and those
22 are set forth on paragraph 96 of your affidavit on page 29.

23 Specifically, it's your testimony that disabling
24 telematics would impact five vehicle features; is that correct?

25 A. Yes, sir.

1 Q. And so the first one is emergency crash notifications,
2 yes?

3 A. Yes, sir.

4 Q. And to your knowledge, a vehicle's ability to send
5 emergency crash notifications isn't required by any federal
6 safety regulation or law; is that right?

7 A. Yes, sir.

8 Q. And it's not your opinion in this case that a vehicle that
9 lacks the ability to send emergency crash notifications is out
10 of compliance with federal safety regulations and law?

11 A. Yes, sir.

12 Q. That's not your opinion?

13 A. That is not my opinion.

14 Q. The second feature you identify is remote vehicle
15 slowdown. To your knowledge, remote vehicle slowdown is not a
16 feature that's required by any federal safety regulation or
17 law; is that correct?

18 A. Yes, sir.

19 Q. And it's not your opinion in this case that a vehicle that
20 lacks remote vehicle slowdown capability is out of compliance
21 with federal safety regs; is that correct?

22 A. That is correct.

23 Q. A third feature you identify is the ability to communicate
24 stolen vehicle recovery messages. And to your knowledge, that
25 isn't required of vehicles by any federal safety regulation or

1 law, correct?

2 A. Yes, sir.

3 Q. That's correct?

4 A. That is correct.

5 Q. And it's not your opinion in this case that a vehicle that
6 lacks a stolen vehicle recovery feature is out of compliance
7 with the federal safety regs; is that correct?

8 A. Correct.

9 Q. The fourth feature you identify is intrusion detection,
10 and to your knowledge, intrusion detection isn't required by
11 any federal regulation safety or law; is that correct?

12 A. Correct.

13 Q. And similarly, it's not your opinion that a vehicle that
14 lacks intrusion detection system is out of compliance with
15 federal safety regulations; is that correct?

16 A. Correct.

17 Q. And the fifth feature you identify is firmware
18 over-the-air updates. And to your knowledge, firmware
19 over-the-air update capability isn't required by any federal
20 safety regulation or law; is that correct?

21 A. That is correct.

22 Q. And it's not your opinion that a vehicle that lacks the
23 ability to receive firmware over-the-air updates is out of
24 compliance with federal safety regulations; is that correct?

25 A. That is correct.

1 Q. I'd like to ask you, Mr. Bort, about -- about your process
2 for evaluating the overall cybersecurity of a whole car.

3 To start that process, you'd look for access points;
4 is that right?

5 A. Yes, sir.

6 Q. In other words, you would analyze the car's surface area?

7 A. Yes, sir.

8 Q. And to do that, you would want to consult the car's
9 architectural diagram; is that correct?

10 A. Yes, sir.

11 Q. And you'd want to see all of the car's electrical systems,
12 yes?

13 A. Yes, sir.

14 Q. As part of your process, you'd also want to consult
15 specification documents; is that right?

16 A. That's broad.

17 I mean, are you referring to, like, technical
18 specifications?

19 Q. Let's take a look.

20 So as part of the process of evaluating the
21 cybersecurity of a whole car, you would want to consult
22 documents that tell you how those access points work; is that
23 correct?

24 A. Yes, sir.

25 Q. And one thing that -- that you would want to consult to do

1 that is specifications that tell you that; is that correct?

2 A. Yes, sir, the technical specifications.

3 Q. The technical specifications.

4 And then the next step in your process for evaluating
5 the cybersecurity of a whole car is that you'd want to observe
6 how the vehicle actually behaves; is that right?

7 A. Yes, sir.

8 Q. And in connection with that step of the process, you'd
9 want to use the vehicle's wiring diagram; is that correct?

10 A. Yes, sir.

11 Q. Specifically, you would want to use the wiring diagram to
12 compare against what you actually see in real life; is that
13 right?

14 A. Yes, sir.

15 Q. And as part of your process for evaluating a given car's
16 overall cybersecurity, you would find it helpful to interview
17 the folks who manufacture and design that vehicle; is that
18 right?

19 A. Yes, sir.

20 Q. Now, you, I think we said earlier, signed two reports
21 concerning your opinion in this case; is that right?

22 A. Yes, sir.

23 Q. And the first one was completed in February of this year,
24 give or take; is that correct?

25 A. Yes, sir.

1 Q. And that report was about 25 pages long, give or take; is
2 that so?

3 A. Yes, sir.

4 Q. And it appended a list of the documents that you had
5 considered in forming your opinion; is that correct?

6 A. Yes, sir.

7 Q. And that list included over a hundred documents that
8 originated with FCA; is that correct?

9 A. Yes, sir.

10 Q. And it also listed, give or take, 40 documents that
11 originated with General Motors; is that correct?

12 A. Yes, sir.

13 Q. And you also signed a written rebuttal report of your
14 opinion in this case. Do you remember that?

15 A. Yes, sir.

16 Q. And that rebuttal report was signed in early May of this
17 year, so just about a month ago; is that right?

18 A. Yes, sir.

19 Q. And that was before the time that you sat for a deposition
20 in this case; is that correct?

21 A. Yes, sir.

22 Q. The rebuttal report was about 14 pages long, give or take.
23 Does that sound right?

24 A. I'll trust you, yes, sir.

25 Q. And similar to the initial report, your rebuttal report

1 appended a list of the documents that you had considered in
2 connection with forming the opinions set forth in your rebuttal
3 report; is that correct?

4 A. Yes, sir.

5 Q. And that list included a number of exhibits from
6 depositions that other folks had given in this case; is that
7 correct?

8 A. Yes, sir.

9 Q. And it also included about 30 additional documents that
10 originated with FCA; is that right?

11 A. Yes, sir.

12 Q. And that list included almost 250 documents that
13 originated with -- with General Motors; is that correct?

14 A. Yes, sir.

15 Q. And it also included about 45 documents that originated
16 with the Alliance for Automotive Innovation; is that correct?

17 A. Yes, sir.

18 Q. Now, all of those documents that are listed in your two
19 reports, you didn't review all of them yourself; is that
20 correct?

21 A. Yes, sir.

22 Q. It's correct that --

23 A. That is correct.

24 Q. -- that is correct?

25 In particular, you didn't review any architecture

1 diagrams for any FCA vehicles in connection with your work on
2 this case; is that correct?

3 A. I thought I had looked at FCA architecture diagrams.

4 Q. So we spoke a moment ago about the deposition that you
5 gave in this case, and you remember sitting for the deposition,
6 right?

7 A. Yes, sir.

8 Q. And all the way at the very beginning of the deposition
9 you swore an oath to tell the truth; is that correct?

10 A. Yes, sir.

11 Q. And in fact, I think you testified at the deposition there
12 was no reason that you were incompatible of doing that on that
13 day; is that right?

14 A. Yes, sir.

15 Q. And after the deposition had concluded, you received a
16 copy of the transcript; is that correct?

17 A. Yes, sir.

18 Q. And you read that copy of the transcript, yes?

19 A. Yes, sir.

20 Q. And you actually -- it looks like it was less than two
21 weeks ago, you signed a certificate indicating that you had
22 read the transcript and that it was a correct transcription of
23 the answers given by you to the questions propounded. Do you
24 remember that?

25 A. Yes, sir.

1 Q. And so your deposition -- the transcript of your
2 deposition appears in a tab in your binder.

3 Can I ask you to flip to the very bottom of page 129
4 of that transcript.

5 And beginning at line 2 on page 129 going over to page
6 130, you were asked: Okay. And did you review any
7 architecture diagrams for any FCA vehicles?

8 And you answered: No, I did not look at the
9 architecture diagram, the vehicle architecture diagrams for FCA
10 vehicles.

11 Did I read that portion of the transcript correctly?

12 A. Yes, sir.

13 Q. Now, you also did not, in connection with forming your
14 opinions in this case, review wiring diagrams for FCA vehicles;
15 is that correct?

16 A. Yes, sir.

17 Q. In fact, at the time you gave your deposition, which I
18 believe was May 21st; is that correct? Does that sound right?

19 A. It sounds right.

20 Q. At the time you gave your deposition on May 21st, you
21 didn't know how many different architectures FCA was currently
22 using in its vehicles; isn't that correct?

23 A. Yes, sir.

24 Q. And that was so even though in the appendix to your
25 rebuttal report you indicated that you had reviewed the

1 deposition testimony of Steve McKnight; is that correct?

2 A. Yes, sir.

3 Q. So in connection with -- with forming your opinions in
4 this case, you didn't review any FCA specification documents;
5 is that correct?

6 A. That is correct.

7 Q. You didn't review any General Motors specification
8 documents either, did you?

9 A. That is correct.

10 Q. In fact, you didn't review any OEMs' specification
11 documents in connection with forming your opinions for this
12 case; is that right?

13 A. That is correct.

14 Q. The only documents that you do remember personally
15 reviewing in connection with forming your opinions for this
16 case were architecture and wiring diagrams for General Motors
17 vehicles; is that correct?

18 A. Yes, sir.

19 Q. Now, as part of your work on this case, members of General
20 Motors' staff were made available to you; is that correct?

21 A. Yes, sir.

22 Q. And you didn't personally interview them; is that correct?

23 A. That is correct.

24 Q. Nor did you personally interview the members of FCA's
25 staff that were made available to you; is that also correct?

1 A. That is correct.

2 Q. Instead, you sent members of your staff to do it; is that
3 right?

4 A. Yes, sir.

5 Q. And your staff assisted you in forming your opinions that
6 you set forth in this case; is that right?

7 A. Yes, sir.

8 Q. And at times you asked your staff for additional documents
9 and information; isn't that right?

10 A. Yes, sir.

11 Q. At the time you gave your deposition last month, you
12 didn't remember what additional information, documents you
13 asked your staff for; is that correct?

14 A. That is correct.

15 Q. And you actually didn't know at the time you gave your
16 deposition whether your staff had obtained that additional
17 information for you; isn't that right?

18 A. Yes, sir.

19 Q. All in all, you personally spent about 40 hours working on
20 this case as of the time that you gave your deposition on
21 May 21st; is that right?

22 A. Yes, sir.

23 Q. And that estimate included the time that you spent
24 preparing for your deposition; isn't that right?

25 A. Yes, sir.

1 Q. And it also included your time on the day of the
2 deposition; isn't that correct?

3 A. Yes, sir.

4 Q. So prior to your work on this case, going back to -- going
5 back to 2014, give or take, you worked up something that you
6 call a Ford on a Board; is that right?

7 A. Yes, sir.

8 Q. And that was basically a reverse engineered model of a
9 given vehicle's electrical systems; is that correct?

10 A. Yes, sir.

11 Q. And the vehicle was a 2012 Ford Focus; is that right?

12 A. Yes, sir.

13 Q. The 2012 Ford Focus that you -- that you worked up into
14 this Ford-on-a-Board model, it didn't have a telematics module;
15 is that correct?

16 A. Yes, sir.

17 Q. And it didn't have a central gateway module, at least one
18 that was designed to filter externally originating traffic; is
19 that correct?

20 A. Yes, sir.

21 Q. And this 2012 Ford Focus that you worked up into this
22 model didn't have anything that you would term as cybersecurity
23 on it; is that correct?

24 A. There were natural security features, but -- so not
25 exactly, yes. Yes, sir.

1 Q. And I just want to make sure that we have it clear. It's
2 your testimony that the 2012 Ford Focus that you reverse
3 engineered and worked up into this Ford-on-a-Board model did
4 not have any features that you would term as cybersecurity; is
5 that correct?

6 A. Yes, sir.

7 Q. Now, again, prior to your work on this case before you
8 were engaged to work on this case, your firm -- your firm is
9 called GRIMM, right?

10 A. Yes, sir.

11 Q. And GRIMM had done some work with automotive manufacturers
12 prior to you being engaged to provide an opinion for this case;
13 is that right?

14 A. Yes, sir.

15 Q. And specifically, GRIMM had previously been engaged to
16 work with somewhere between two and four manufacturers; is that
17 correct?

18 A. Yes, sir.

19 Q. And of those two to four manufacturers, you may have had
20 some involvement with the initial scoping of the work that
21 GRIMM was going to do for them; is that correct?

22 A. Yes, sir.

23 Q. But of those two to four, there's only one that you
24 personally really got involved in the work of the engagement;
25 is that correct?

1 A. Yes, sir.

2 Q. And that one that you worked on was a penetration test; is
3 that correct?

4 A. Yes, sir.

5 Q. And you did that penetration test in 2016; is that right?

6 A. Yes, sir.

7 Q. That penetration test related to a model year '17 vehicle,
8 yes?

9 A. Yes, sir.

10 Q. And it only related to that one model; is that correct?

11 A. Yes, sir.

12 Q. Is it correct, Mr. Bort, that as you sit here today, there
13 are OEMs who currently sell vehicles in the United States whose
14 architectures you do not have specific firsthand knowledge of?

15 A. Yes, sir.

16 Q. And in fact, in connection with preparing your opinions on
17 this case, you haven't considered architecture diagrams for any
18 model year '22 vehicle manufactured by any OEM other than
19 General Motors and FCA; is that correct?

20 A. Yes, sir.

21 Q. And in preparing your opinion for this case, you haven't
22 considered technical specifications for any model year '22
23 vehicle made by any OEM other than General Motors or FCA; is
24 that correct?

25 A. Yes, sir.

1 Q. Nor in connection with forming your opinions for this case
2 have you considered the wiring diagrams of any vehicle made by
3 any OEM other than General Motors or FCA; is that correct?

4 A. Yes, sir.

5 Q. Now, is it fair to say that in your testimony, Mr. Bort,
6 you are offering opinions about what the Data Access Law would
7 require of OEMs? Is that a fair statement?

8 A. Yes, sir.

9 Q. And is it also a fair statement that you are offering
10 opinions about the consequences of complying with the Data
11 Access Law?

12 A. Yes, sir.

13 Q. And those opinions that you're offering are premised on
14 your particular understanding of what the Data Access Law
15 requires; is that right?

16 A. Yes, sir.

17 Q. Now, the Data Access Law defines mechanical data. You're
18 familiar with that definition, yes?

19 A. Yes, sir.

20 Q. And you have an understanding of what data falls within
21 that definition, yes?

22 A. Yes, sir.

23 Q. And part of your understanding is that mechanical data, as
24 it's defined in the Data Access Law, includes firmware for the
25 ECU's in a car; is that right?

1 A. Yes, sir.

2 Q. And it's also your understanding that mechanical data, as
3 it's defined in the law, includes all traffic for any kind of
4 internal messaging that concerns the vehicle's operation; is
5 that also correct?

6 A. Yes, sir.

7 Q. It's also your understanding that the scope of mechanical
8 data, as it's defined in the law, includes telematics data,
9 yes?

10 A. Yes, sir.

11 Q. And it's your understanding that the scope of mechanical
12 data includes diagnostic functions that previously had been
13 reserved for the OEMs' exclusive use in engineering and
14 manufacturing; is that correct?

15 A. Yes, sir.

16 Q. And the opinion that you're offering today is premised on
17 those understandings about the scope of mechanical data under
18 the Data Access Law, yes?

19 A. Yes, sir.

20 Q. Now, the Data Access Law also uses the phrase "open
21 access"; are you familiar with that?

22 A. Yes, sir.

23 Q. And you also have a view of what the phrase "open access"
24 means, yes?

25 A. Yes, sir.

1 Q. And your view is that open access, as it's used in Data
2 Access Law, means that anyone can have access to the insides of
3 a vehicle; is that correct?

4 A. Yes, sir.

5 Q. And you relied on that view in rendering the opinion that
6 you're setting forth to this Court today; is that correct?

7 A. Yes, sir.

8 Q. Now, you testify at page -- excuse me, paragraph twenty --
9 you testify at page 53 of your affidavit, it's on page 18,
10 about authentication, and you testify specifically that
11 authentication is the identification of an actor seeking access
12 to assist, I take it; is that -- is that correct?

13 A. Yes, sir.

14 Q. And you also testify in that very same paragraph about
15 authorization, yes?

16 A. Yes, sir.

17 Q. And authorization, you testify, goes to the degree of
18 access provided, and that's degree of access provided to
19 somebody who has access to a system; is that right?

20 A. Yes, sir.

21 Q. It's your understanding, isn't it, that the Data Access
22 Law prohibits vehicle OEMs from being involved in the
23 authentication process; is that correct?

24 (Pause.)

25 A. Yes, sir.

1 Q. In fact, it's your view that the -- or it's your
2 understanding, I should say, that the Data Access Law literally
3 says that OEMs are not supposed to be a part of the
4 authentication process; isn't that right?

5 A. Well, not literally; it says "authorization," but the two
6 go together.

7 Q. Can I ask you, Mr. Bort, to turn to your deposition
8 transcript in your binder there. And I'd like to go to page
9 182 of your transcript.

10 And you're asked a question beginning on line 12: And
11 so looking at paragraph 1B on paragraph 4, which is a reference
12 to your report, the question continues, Not allowing the OEMs
13 to authenticate diagnostic procedures, is that your
14 understanding of the application of Section 2 of the Right to
15 Repair law that we read a moment ago?

16 There was an objection by counsel.

17 And you answered: So, the statement literally says
18 that OEMs are not supposed to be a part of the authentication
19 process.

20 You were then asked: And is that your understanding
21 of Section 2 of the new Right to Repair law?

22 And you answered, Yes.

23 Did I read that passage correctly?

24 A. Yes, sir.

25 Q. And you rely on that understanding of the Data Access Law

1 in forming your opinions that you're giving in this Court; is
2 that right?

3 A. Yes, sir.

4 Q. Now, you also testify -- this is at paragraph 55 of your
5 affidavit on page 19 -- you testify that the Data Access Law
6 eliminates the ability for OEMs to use certificate-based
7 authentication on diagnostics; is that your testimony?

8 A. Yes, sir.

9 Q. And you also testify in paragraph 55 of your affidavit
10 that the Data Access Law deprives OEMs of the ability to
11 authenticate the software running on their ECUs; is that also
12 your testimony?

13 A. Yes, sir.

14 Q. And it's your understanding of the Data Access Law, yes,
15 that the law requires all parts of a vehicle's electronics to
16 be fully accessible without authentication; is that right?

17 A. Yes, sir.

18 Q. And you rely on that view in the opinion that you're
19 providing to the Court today, yes?

20 A. Yes, sir.

21 Q. Now, in paragraph 57 of your affidavit you testify
22 about -- this is on page 19 -- you testify about the security
23 access, yes?

24 A. Yes, sir.

25 Q. And security access is a form of authentication; is that

1 correct?

2 A. Yes, sir.

3 Q. In paragraph 58 of your testimony you testify about three
4 procedures that protect the process of updating software on an
5 ECU, yes?

6 A. Yes, sir.

7 Q. And each of those procedures is a method of
8 authentication, correct?

9 A. Yes, sir.

10 Q. You also testify -- this is paragraph 43 of your affidavit
11 on page 14 -- you testify about the separation of vehicle
12 components based on trust levels; is that right?

13 A. Yes, sir.

14 Q. And you testify -- actually at a different place in your
15 affidavit, in paragraph 86 -- you testify that separation of
16 components based on trust levels is often achieved through the
17 central gateway module; is that correct?

18 A. Yes, sir.

19 Q. Now, nothing in the Data Access Law explicitly addresses
20 central gateway modules, does it?

21 A. No, it doesn't.

22 Q. There's nowhere in the Data Access Law that says you can't
23 do this with a central gateway -- or a central gateway module;
24 is that correct?

25 A. It does not say central gateway model, no -- module, no.

1 Q. In fact, it's your view that an OEM could continue to use
2 a central gateway module under the Data Access Law; is that
3 right?

4 (Pause.)

5 A. The module would not be able to enforce authorization or
6 authentication.

7 Q. Nonetheless, it's your view that an OEM could continue to
8 use a central gateway module under the Data Access Law, yes?

9 A. Yes, sir.

10 Q. And in fact, you have a view of what that would look like
11 if an OEM continued to use a central gateway module under the
12 Data Access Law, specifically -- specifically your concern is
13 that maintaining a secure system under the Data Access Law
14 might require bigger and better I think maybe major league
15 hardware to be used for the central gateway module; is that
16 right?

17 A. The context there was education on where you were pushing
18 on how the central gateway module could just enforce that, and
19 I was noting that, no, it couldn't; that was an example of it.
20 I wasn't necessarily suggesting that was the solution.

21 Q. Nonetheless, if an OEM is to use a central gateway module
22 under the new Data Access Law, which I think you just testified
23 they can, you would want to see that central gateway module use
24 bigger and better hardware that's commensurate to the new
25 requests that are going to be put upon it; is that right?

1 A. Yes, that would be at least one possible requirement.

2 Q. And in fact, if an OEM did that, used bigger, better,
3 major league central gateway module, that could be combined
4 with other cybersecurity controls to maintain the separation
5 based on trust levels that you testify about; is that correct?

6 A. Yes, sir.

7 Q. You also testify in this case about defense in depth, yes?

8 A. Yes, sir.

9 Q. And specifically, this is paragraph 27 of your affidavit,
10 it's on page 9, you testify that defense in depth involves
11 creating a multilayered approach to vehicle cybersecurity; is
12 that your testimony?

13 A. Yes, sir.

14 Q. And the point of defense in depth is to create multiple
15 obstacles to a potential attacker; is that correct?

16 A. Yes, sir.

17 Q. Defense in depth doesn't require any particular specific
18 cybersecurity control, does it?

19 A. No, it does not.

20 Q. Rather, defense in depth is about the layering; is that
21 correct?

22 A. Yes, sir.

23 Q. Now, you agree that at least some cybersecurity controls
24 and techniques continue to be permitted by the new Data Access
25 Law, right?

1 A. Yes, sir.

2 Q. And it's your view that those cybersecurity controls can
3 be layered in a way that creates a defense in depth; is that
4 right?

5 A. I mean -- can you -- can you repeat the question?

6 Q. Sure.

7 It's your view that those cybersecurity controls that
8 you believe continue to be permitted under the Data Access Law
9 could actually be layered in a way that creates a defense in
10 depth; isn't that so?

11 A. Yes, it's possible.

12 Q. And it might require a new architecture, yes?

13 A. Yes, sir.

14 Q. But it can be done, correct?

15 A. We could put a man on the moon, yes, sir.

16 Q. In fact, if an OEM were to comply with the new Data Access
17 Law, you'd actually recommend that they change the architecture
18 to accommodate what the law is asking them to do, yes?

19 A. Yes, sir.

20 Q. But your view is that if an OEM were to devote the
21 resources, the money, and the manpower to design such a new
22 architecture and have an appropriate amount of time to do that,
23 that that OEM could comply with the Data Access Law free of
24 your concerns about security; is that correct?

25 A. Yes, sir.

1 MR. HASKELL: I don't have any further questions, Your
2 Honor.

3 THE COURT: All right.

4 MR. LINDER: Thank you, Your Honor.

5 May I proceed?

6 THE COURT: You may.

7 MR. LINDER: Thank you, Your Honor.

8 REDIRECT EXAMINATION BY MR. LINDER:

9 Q. Good afternoon, Mr. Bort.

10 A. Hello.

11 Q. Can you get a little closer to the microphone?

12 A. Yes, sir. I think I moved it. There we go.

13 Q. Perfect. Thank you very much.

14 So you were asked on cross-examination a number of
15 questions on a number of topics. Let's start with your
16 experience and expertise with vehicle architecture and
17 cybersecurity.

18 Ballpark, how many OEMs -- for how many OEMs do you
19 have information about their vehicle architecture?

20 A. Several.

21 Q. More than five?

22 A. Probably around that.

23 Q. Okay. What is your experience working with OEMs' vehicle
24 architecture and their cybersecurity protections?

25 A. So going back to creating a Ford on a Board, which we

1 called 3PO, was really the beginning of where my company,
2 GRIMM, which was at that time just a few of us, embarked on
3 vehicle security.

4 At that time we were a general cybersecurity company
5 that had done a lot of work on a lot of agencies. There's a
6 lot of overlap in terms of general computing security practices
7 and car security, but of course you need to anchor yourself in
8 the specifics. So we started with doing that and we began
9 building relationships with OEMs.

10 At that time we also discovered some concerns that we
11 had around vulnerabilities in several systems. We approached
12 several OEMs, we just did not go public about it, and so at the
13 time we didn't get any work. And then, in 2015, Mr. Miller and
14 Mr. Valasek essentially created that industry where that was a
15 thing.

16 From there we started getting much more work, and I
17 became very active and involved on the industry side of that.
18 At that same time I was also part of the Car Hacking Village
19 where the Car Hacking Village is essentially an independent
20 group of security researchers that do car security. At that
21 time it was most famous for being a part of one of the largest
22 hacking security conferences in the world called Defcon, and I
23 ran our exhibit at Defcon from about, I want to say, like '14
24 to '16, and then -- and then, as the company continued to grow,
25 I wasn't -- after that 2016 work, I wasn't able to continue to

1 do as much hands on, but I was still a part of doing the
2 scoping and the risk assessments.

3 So whenever we would have client data come in for a
4 potential request for proposal or we were looking at our own
5 internal research and development or we were building out our
6 training program where we do defensive automotive engineering
7 training for a lot of the OEMs, actually, and the supply chain,
8 I was -- I would help with framing what would be in the
9 syllabus, what would be the risk assessment, and signing off on
10 the class structure and content.

11 Q. Thank you.

12 Have you done any work with tier 1 suppliers?

13 A. Yes, sir.

14 Q. What work have you done?

15 A. Similar, the difference is just much smaller scope.

16 Q. How about heavy trucking OEMs?

17 A. Yes, sir.

18 Q. What work have you done with them?

19 A. Same kind of work, that one I'm also involved with, the
20 National Motor Freight Transportation Association, NFTA, which
21 is the heavy trucking trade association, that of course has a
22 significant concern in cybersecurity.

23 Q. You heard I think Mr. Tierney testify earlier today about
24 Auto-ISAC. Is that a term with which you're familiar?

25 A. Yes. So the ISACs are information sharing analysis

1 centers. They were stood up a couple of decades ago as a
2 concept for industry to share threat information and knowledge,
3 and their verticals; so, for example, there's a financial one,
4 there's an auto one.

5 The auto one, again, with this all being very new, was
6 kind of a new concept, I think was not taken seriously at the
7 beginning; and then sometime, I want to say around 2016, '17,
8 there was a new leader who came in, Faye Francy, and they kind
9 of reenergized the base. And so we became very active for -- I
10 personally was very active for a couple of years with that.

11 Q. And active in what way? You did the trainings?

12 A. Our company does the official training for Auto-ISAC now,
13 and then I was personally involved with our folks giving talks
14 at those conferences, as well as attending and interfacing with
15 industry.

16 Q. So based on all of that work with OEMs, how much
17 differentiation is there between OEMs around cybersecurity
18 protections related to safety and emission critical systems?

19 A. I mean, I would say that about 95 percent of the
20 architecture approaches and best practices are about the same.

21 Q. Why is that?

22 A. Turns out that they all share this kind of information and
23 discussions. This is part of what the Auto-ISAC facilitates,
24 and you kind of double down on the stuff that works.

25 Q. You were asked about your work in this case.

1 When did you first hear about the Data Access Law?

2 A. Sometime early 2020, I guess it was about spring, summer.

3 Q. What was your initial view when you first heard about the
4 Data Access Law?

5 A. So we, of course, had been interested as independent
6 security researchers, in Right to Repair for a number of years,
7 making it easier -- so the concept that security does not
8 provide security. So not knowing -- you know, preventing easy
9 awareness of something isn't just going to make it secure. And
10 so when the law came out, we were interested to see if -- how
11 that was going to continue to make it easier for us to do our
12 research and advise industry, and we were surprised by how far
13 it went, and we grew concerned.

14 Q. Why?

15 A. Because it was a too far, too fast with potentially
16 catastrophic safety risks.

17 Q. Tell me why.

18 A. So, I mean as --

19 Q. -- but go ahead. Tell me.

20 A. As was testified this morning, the supply chain in this
21 industry cannot just turn on a dime, and it takes a number of
22 years to implement these changes. And that was -- that -- I
23 gained that knowledge from actually working with the OEMs as we
24 found things and understanding what their ability was to effect
25 change at different levels of criticality based on the design

1 with how long it took for them to do the work through not only
2 just at the high level with the model architecture but when
3 you're down looking at the subsystems.

4 And so when I saw the scope of this requirement, I was
5 just like there's -- there's no way that they can do that.

6 And so, inherently, compliance requires the abrogation
7 of the protections that have been built into them that have
8 just been layered and built up over time.

9 I mean, going back to the earlier testimony, I was
10 talking about what was on the 2012 Ford Focus. I mean,
11 compared to the defense in depth and the engineering on the
12 architecture that exists today, I mean it's almost night and
13 day.

14 Q. When were you first engaged to work on this case?

15 A. January 2021.

16 Q. And what did you do after you were engaged?

17 A. I sat down with the team and immediately said, all
18 right -- I mean, because we had a very short time frame, so
19 what's the scope here, let's -- let's talk through this, and
20 let's schedule out what we need to do against our deliverables
21 to our deadlines, and then I set the priorities, as well as
22 what was going to be done with the scope of the paper.

23 Q. Did you at that point outline what your initial views or
24 areas of inquiry might be?

25 A. Yes, sir.

1 Q. What did you ask the team to go gather for you?

2 A. Sure. So there were really two elements there. First, I
3 wrote the high-level outline of what we had for that initial
4 report, that then informed the questions that we wanted to ask
5 the OEMs. Unfortunately, I was not personally able to attend
6 those, but the meetings with the OEMs were more confirmatory to
7 make sure that we didn't walk in with a bias that was
8 incorrect. So we wanted to make sure that, hey, this is what
9 we understand is the state of art because we're part of it, and
10 so we just wanted to make sure that that was in fact correct.
11 And essentially, the meetings were mostly, yes, that's correct.

12 Q. Okay. You were asked about paragraph 24 of your
13 affidavit, about the Jeep hack, about when whether it was a
14 fully remote attack or not.

15 Let me first ask you briefly, could you describe the
16 different levels and types of attacks.

17 A. Sure. So this is -- this is the concept of threat
18 modeling, and colloquially I have the expression a hacker can't
19 hack what they can't touch. So I have to -- that's why access
20 is always the starting point, and there's three levels of
21 access: physical proximity, what I can touch and I have to
22 physically be able to touch it; RF proximity, what is my
23 ability to just interact with the emanations, the radio
24 frequencies of that vehicle; and then the final, of course, is
25 internet accessible, anywhere in the world.

1 The Jeep hack was a demonstration of that third level
2 with an internet accessible hack. The fact that they had
3 physical access to it was the equivalent of having the physical
4 access to a test bench. Of course you're going to have -- you
5 have to have the thing itself to be able to conduct the tests,
6 and the research to then demonstrate that level of attack.
7 Every pen test that we've ever done, whether it's any of those
8 three levels, inherently, the more data and the more physical
9 access we can get, the easier it is to accomplish it, to make
10 it -- to reduce the amount of time that it's going to take me
11 to demonstrate that. But the key is that you can demonstrate
12 that attack vector solely at that level, which is what Chris
13 and Charlie did back in 2015. It was a fully remote hack.

14 Q. Okay. You said "pen test," that's a penetration test?

15 A. Yes, sir.

16 Q. Okay. Very briefly, what are the -- for a local attack,
17 what are the ways into a vehicle?

18 A. Physical access, so -- I mean, most common would be, of
19 course, the OBD-II port. There are others. I can start taking
20 panels off and I can cut your brake lines, I mean --

21 Q. And you said for a proximate attack, you mentioned RF.
22 Give me some examples of that. What sort of frequencies are
23 you attacking that way?

24 A. Sure. So one that comes from regulation, of course, is
25 the Tire Pressure Monitoring System, TPMS, which is mandatory

1 in American cars, and that operates I believe at two RF
2 frequencies. So that is an RF frequency that is mandatory to
3 have on that. The other, which is more of a customer feature,
4 would be Bluetooth.

5 Q. You've discussed fully remote attacks, is there any
6 limitation on places anywhere in the world from which a remote
7 attack could be launched on a telematically enabled car?

8 A. By definition if it's on the internet, it's on the
9 internet.

10 Q. You've said that 95 percent of OEMs' approach to
11 cybersecurity protections are similar. So let's briefly go
12 over -- give me -- what is defense in depth? Let's go through
13 the four or five approaches that OEMs commonly take to
14 cybersecurity protection. What is defense in depth?

15 A. Sure. So a multilayered approach, so the analogy that I
16 use is that each of your layers of security are effectively
17 like a slice of Swiss cheese. I do not have perfect security
18 at any particular level, right, there's going to be holes,
19 holes that I know of, holes that I don't know of. And by
20 slice -- you know, by having multiple slices of this cheese,
21 overall I can form a dense block that provides that level of
22 security.

23 The other part of it is that you're increasing the
24 cost to the attacker. If I have a flat network, then once I'm
25 in, by definition I have all of those things, that's a low

1 cost.

2 Heterogeneity is the defense's friend. So having
3 different things that I have to be able to work through and
4 each one and understand one of those is going to increase the
5 cost for me to be able to make that a target.

6 Q. I think you described that in your affidavit as a pivot.
7 What is a pivot? How does that work?

8 A. Sure. So a pivot is lateral movement. The initial point
9 of access to the vehicle is where I start, because by
10 definition I have to begin where I have access, but that access
11 is not the final destination to where I want to be able to
12 accomplish whatever the goal I have as an attacker. So I have
13 to move laterally, pivot through the network from system to
14 system through the networks to be able to get to that point of
15 interest.

16 Q. Okay. What is a -- what is a hardware-based route of
17 trust?

18 A. So a hardware-based route of trust is I'm -- I have
19 integrity and insurance of the code that is running on a
20 particular system; that is, it has not been manipulated, it is
21 what it was supposed to be so when it starts up, I'm confident
22 that that was in fact the software that will operate within the
23 correct parameters with that system.

24 Q. Is that something like secure boot?

25 A. Yes, sir.

1 Q. What is a small trusted computing base?

2 A. A small trusted computing base is -- it's kind of actually
3 the concept of like a kernel in a computer, you have different
4 levels of what is critical for security and then what would be
5 more like a user feature. So we distinguish those so that you
6 kind of know where to circle the wagons and what's important.
7 And then the other pieces have a lower priority and you
8 separate those.

9 Q. Compartmentalization?

10 A. Compartmentalization is hardware segmentation. So, again,
11 going back to the concept of a lateral movement or a pivot from
12 an attacker, hardware compartmentalization means that I have to
13 actually cross through a hardware barrier to be able to do
14 that.

15 Q. Okay. And certificate-based authentication?

16 A. Certificate based, so a certificate is essentially a
17 unique digital code that through math means that it only will
18 work if you know the correct keys. So that this is signed --
19 and I know it's been signed, and this is my way of assuring
20 that that initial session or that code does in fact come from
21 the source that I thought it did.

22 Q. Okay. So putting those all together, take an example like
23 I want to hack into your car's telematics and get to the
24 braking system. What would I have to do? How would I have to
25 go through it?

1 A. So the first point would be the telematics unit -- so
2 again, threat model, I mean, the best threat model is the one
3 where I'm in physical proximity.

4 Physical proximity, of course, means I need to know
5 exactly where your car is which means I understand where you
6 live. A step up from that with RF would mean I would need to
7 know your pattern of life, where are you, where would you be at
8 what times and make sure that I have proximate access to
9 accomplish what I want to do within that period of time.

10 And then, finally, internet accessible, which is what
11 telematics does, is I just have to be able to uniquely identify
12 that the -- what I'm seeing, threats, responding through the
13 telematics unit does in fact correspond to your identifier,
14 that that's you in your car.

15 Once that access is -- once that is established, then
16 I have to figure out how do I gain access. So just because I
17 found it doesn't mean I can just get on there.

18 So the most common approach, of course, would be a
19 technical exploit which is finding a vulnerability in the code
20 in how the telematics unit is negotiating those sessions. I
21 compromise the telematics unit, and I've gained access to that
22 initial point. From there I would have to use my understanding
23 of the particular architecture. So going to earlier where he
24 was talking about technical specifications and wiring diagrams
25 to technically be able to accomplish that beyond just doing a

1 risk profile, at that point I need that documentation because I
2 need to understand specifically what talks to what, how does it
3 talk to that, and then from that reverse engineering what I
4 would need to do to get to where I want to go.

5 In the case of a braking ECU, it's the design of the
6 car should be, and I believe they all do this, not directly
7 accessible, so I would have to pivot through at least one other
8 unit before going directly to the braking ECU to accomplish
9 what I want, and most likely that would require me to, at a
10 minimum, to be able to confuse or deceive or disable the
11 rationality check on whatever commands I'm sending to that
12 braking unit so that it takes a command that would put it out
13 of tolerance, or if I'm trying to do a firmware update for some
14 other reason being able to defeat that secure boot and signing
15 to be able to put the code that I want to on that system.

16 Q. What are some of the purposes for which somebody might
17 want to do that?

18 A. Specifically with an attack on a braking system?

19 Q. Sure or -- let's take a braking system, but, sure.

20 A. I mean, how broad do we want, just any motive?

21 Q. Give me the why do hackers hack? Why would somebody want
22 to break into a vehicle's safety critical features? What can
23 you do with that?

24 A. Okay. So breaking into a critical safety feature is
25 clearly a malicious intent for causing physical harm. So not

1 to be too Hollywood here, but, most likely, that would be tied
2 to assassination or death. The other lesser could be that it's
3 possible you would want to do that to potentially cause a minor
4 accident that shuts down say a freeway, tying this back to
5 something that is unclassified which is an open project that I
6 work on called Jack Voltaic. This is what the Army Cyber
7 Institute we've been looking at with respect to the impacts of
8 critical infrastructure on force projection so we don't just --
9 if something happens somewhere in the world, we can't just
10 immediately like teleport troops somewhere; we're not there
11 yet. But -- so you have to ship the troops from a post to
12 likely a port. Most force deployment actually happens
13 overseas; I don't know if most people know that. And so in
14 this example, I would know that the most likely unit to be
15 called to a particular mission because that's actually fairly
16 well-known, I would have to -- I would want to cause some kind
17 of delay through a hack like this to effect a force projection.

18 Q. Okay. I want to turn your attention, if I can, to Section
19 2 of the Data Access Law, which is conveniently on a big poster
20 board in front of you. Do you see that?

21 A. Yes, sir.

22 Q. Okay. You were asked a number of questions on
23 cross-examination about authorization and authentication. Do
24 you remember those questions?

25 A. Yes, sir.

1 Q. Can you explain what you -- how you understand
2 authorization and how you understand authentication and how you
3 understand the relationship between the two?

4 A. Yes, sir.

5 MR. HASKELL: Your Honor, can I ask that the witness
6 take those questions one at a time --

7 THE COURT: Yes.

8 MR. HASKELL: -- instead of three at of time?

9 THE COURT: Yeah, so why don't you break them up,
10 outline what you're going to ask. Just ask the first one, then
11 the second and the third.

12 MR. LINDER: Thank you, Your Honor.

13 BY MR. LINDER:

14 Q. Let's start with authorization.

15 A. Authorization is level of access.

16 Q. What does that mean?

17 A. So, like, being given a key to a house, okay. Only this
18 is -- this is a mansion, so there are different rooms that have
19 different locks and there's a vault in there. Authorization
20 would be what key allows me what access to which of those rooms
21 or the vault within it; the vault would be the most trusted;
22 general access to the house is the lowest level of
23 authorization.

24 Q. What is authentication?

25 A. Authentication is identifying the unique person who would

1 be given that key.

2 Q. And what's the relationship between them?

3 A. They only work together, so I have to know who I am to be
4 able to be given a key; hence, the common user ID password
5 concept that we see in information technology.

6 Q. Is authentication without authorization of much use?

7 A. I mean, that would be like me saying, hi, you're you, and
8 that would be it.

9 Q. Okay. Is -- what are the cybersecurity advantages to car
10 manufacturers being involved in authorizing access to their
11 vehicles?

12 A. Well, as per previous testimony this morning, they are in
13 the best position to understand the safety and function of the
14 complex systems that they are responsible for the operation for
15 the safety of their customers.

16 Q. Do you see any cybersecurity risks if OEMs are no longer
17 in the chain of authorization?

18 A. I do.

19 Q. What are they?

20 A. So the OEM would be in a reactive manner to what's
21 happening with the car. So without the ability to have that
22 control over who's getting what access, they would be required
23 to respond by observation at best versus being able to reduce
24 the risk aperture through the design of the architecture.

25 Q. When you say "respond by observation," you mean after the

1 fact?

2 A. Yes, sir.

3 Q. Would it be more secure or less of a risk if a third party
4 could manage the authorization process?

5 A. Compared to what?

6 Q. Compared to no one.

7 A. Oh, compared to no one? Yes, that's an improvement.

8 Q. Are you aware of any third party currently that could
9 serve that role?

10 A. No, sir.

11 Q. Okay. If the OEM was out of the chain of authorization,
12 which of the cyber protections that we've discussed today would
13 be impacted?

14 A. They're outside of the chain of the authorization.

15 Well, tying that to open access would mean that the --
16 you would only be able to have the holes in the Swiss cheese
17 because anything else would be interpreted as the OEM being a
18 part of the authorization to the vehicle.

19 Q. Sorry, can you say that again?

20 A. The -- you would only have the holes in the cheese from
21 the defense in depth because, by definition, any of that
22 cheese, the authorization would be the OEMs being a part of
23 authorization, so they can't restrict anything within the
24 vehicle.

25 Q. So which of the -- so of the cybersecurity protections

1 we've discussed today would any of those -- if OEMs were out of
2 the chain of authorization would other cybersecurity
3 protections that OEMs have make up for their lack of ability to
4 be in the chain of authorization?

5 A. So there's no such thing as perfect security, and so where
6 I would go with this is that we've increased the risk aperture,
7 and if that's acceptable, then that's a choice. But I don't
8 know what defense-in-depth mechanisms would be allowed other
9 than, again, being able to monitor and then trying to think
10 through what would be within the scope of response that would
11 be allowed.

12 Q. I want to focus on the phrase "standardization" in Section
13 2 of the Data Access Law. Do you see that?

14 A. Yes, sir.

15 Q. So does any such system exist today for all aspects of an
16 OBD system? Is there a standardized system like that?

17 A. The -- there is a standard on OBD-II today, but it does
18 not include all of the functionality of what OBD-II can invoke.

19 Q. Why not?

20 A. Because it doesn't exist.

21 Q. So why isn't -- let me ask it this way.

22 Why isn't the -- why isn't the data accessible from an
23 OBD-II port standardized across all OEMs?

24 A. I don't know why, I just know it isn't.

25 Q. What isn't standardized? Let me ask it that way.

1 A. Ah, okay.

2 Q. Sorry.

3 A. So the -- there is unique -- there is, per OEM, specific
4 functions and diagnostics that are -- that they handle
5 differently. And so those have not been -- there's been no
6 Rosetta Stone that has been defined to say this is how we're
7 going to speak all of those languages through a common
8 language. So there are elements beyond what the core OBD-II
9 port has that are there, they're not standardized.

10 Q. What would happen if it was standardized? What would be
11 the risk from that if it was standardized across all OEMs?

12 A. Yeah, so from a security research perspective, you've now
13 simplified what I have to learn and do to accomplish my goals;
14 whereas, before I might have to speak X number of languages for
15 each OEM to be able to invoke functions or be able to navigate
16 the networks and interface with any subsystem, now I only have
17 to learn the one word to be able to invoke that function and it
18 would inherently work because of standardization for all of
19 those elements, you've now introduced a common point of
20 vulnerability.

21 Q. And I think you had said earlier that heterogeneity is a
22 desired security feature, correct?

23 A. Yes, sir.

24 Q. And that would destroy it?

25 A. That is the opposite of heterogeneity.

1 MR. LINDER: Okay. Your Honor, I have a few
2 demonstratives that I would like to have Mr. Bort walk through.

3 THE COURT: Okay.

4 MR. LINDER: If you could, Ken, please, before you put
5 it up on the screen show -- put just on the AG screen slide
6 number 1 or the one after the title slide.

7 MR. HASKELL: Can we get a copy of this?

8 MR. LINDER: I only have it electronically, so I'm
9 just going to ask you -- please, only on their screen, just on
10 the AG screen.

11 THE COURT: These are not the ones that are in your
12 pretrial binder documents marked for identification? Are they
13 in those?

14 MR. LINDER: I'm sorry, say that again, Your Honor.

15 THE COURT: These are not previously marked,
16 previously show to everybody?

17 MR. LINDER: No, these aren't -- these aren't going to
18 be admitted. These are just demonstratives to help aid
19 Mr. Bort's testimony to elucidate the topics.

20 THE COURT: I'll see them, and perhaps let them stay
21 in my mind, and perhaps not, but they should be shared with
22 counsel before.

23 MR. LINDER: I understand, Your Honor.

24 MR. HASKELL: We would be grateful to see a copy of
25 this. Can you just --

1 MR. LINDER: So, Ken, can you just show it on your
2 screen and have Mr. Haskell look at it?

3 Sorry, Your Honor, I apologize. We should have done
4 this at the break.

5 (Discussion off the record.)

6 MR. LINDER: Your Honor, Mr. Haskell had a good
7 suggestion. We're nearly at the break time, if you want to
8 take it a few minutes early, that would give us a chance to
9 review the graphics without delaying the Court.

10 THE COURT: Okay. So we'll take a break now -- will
11 15 minutes be enough? Okay. We'll take a break until about
12 2:50.

13 THE CLERK: All rise.

14 (Recess taken.)

15 THE CLERK: All rise.

16 (Court entered the courtroom.)

17 THE CLERK: Please be seated.

18 THE COURT: Are we ready to proceed?

19 (Discussion off the record.)

20 THE COURT: Okay.

21 MR. HASKELL: So, Your Honor, I did have a chance on
22 the break, Mr. Linder showed me the PowerPoint slide that
23 they're about to show as a chalk, it is what it is, it
24 expresses the witness' view of the thing, which we don't agree
25 with, and it is what it is.

1 THE COURT: Okay. But I think copies of this should
2 be made. Anything that's exposed to the Court should be made a
3 part of the record. But identified, as I understand it, here
4 for identification is the way we're dealing with most
5 demonstratives.

6 MR. LINDER: Yes, Your Honor. We'll do that this
7 evening.

8 THE COURT: Okay.

9 MR. LINDER: Can you give us number one. The whole
10 thing, please. Thank you.

11 BY MR. LINDER

12 Q. Mr. Bort, can you see the graphic up on the screen in
13 front of you?

14 A. Yes, sir.

15 Q. And what does this describe about Section 2 of the Data
16 Access Law?

17 A. So we -- the intent of this graphic is to highlight what
18 is standardized and available today, what -- and what
19 additional components -- so OBD-II port today in the green
20 circle is the current standardized diagnostic functions that
21 are available, the OBD system possesses OEM-specific functions
22 that are currently available, and then where the law calls for
23 vehicle networks is an expansion of the data that would be in
24 scope.

25 Q. Okay. So let me make sure I understand.

1 So the middle circle which looks orange on the screen
2 that I can see, you said that that is OEM-specific information
3 that's available?

4 A. Yes, sir.

5 Q. Is that standardized today?

6 A. No.

7 Q. Okay. And you read the outer circle of data that's
8 available to be vehicle networks. What in the Data Access Law
9 at Section 2 leads you to that conclusion?

10 Let's start with before the "unless" clause.

11 A. Before the unless?

12 Q. Yeah. So if -- if the OEM is out of the chain of
13 authorization, what happens?

14 A. Okay. So motor vehicle owners and independent repair
15 facilities' access to vehicle on-board diagnostic systems shall
16 be standardized. So the element of vehicle on-board diagnostic
17 systems includes the orange circle.

18 Q. And without authorization?

19 A. And without authorization, that would have to be
20 standardized for all makes and models.

21 Q. Right. And so the first half of the -- of Section 2 gives
22 OEMs a choice of being entirely --

23 A. Sorry.

24 Q. Are you okay there?

25 A. Yeah, I was just making so I had a clean line of sight

1 without the thing blocking.

2 Q. All right. I set those up. So it's -- if they're at all
3 askew, it's my fault.

4 So the first half of Section 2 before the "unless"
5 clause, if OEMs want to hit through that wicket, they have to
6 be entirely both directly and indirectly out of the chain of
7 authorization, correct?

8 A. That is correct.

9 Q. So, effectively, what would they -- what would be -- what
10 could they do to stop people from getting to other parts of --
11 let me ask it this way. Strike that.

12 What parts of the vehicle architecture could they
13 prohibit people from getting to?

14 A. None.

15 Q. Why not?

16 A. Well, without the authorization, I can't restrict that
17 access, and so it's open access. All of the vehicle networks,
18 all of the systems, the networks on that vehicle would be
19 accessible.

20 Q. How about after the "unless" clause, is there anything
21 there that makes you think that it would be the scope that we
22 see on the graphic of all data available on the vehicle
23 network?

24 A. So after the "unless" clause there would be this
25 hypothetical third party that would administer that system. So

1 now we've created a -- what I call the Rosetta Stone, so we
2 have to standardize the access and the way that you are going
3 to interoperate, you're going to talk to the systems, and then
4 this third party would be the one that would handle
5 authentication and authorization.

6 Q. Absolutely. And then -- and after the "unless" clause, to
7 what does the authorization system have to make access
8 available?

9 A. Vehicle networks.

10 Q. And so in this -- so let me ask it this way.

11 What -- is there anything on a vehicle that wouldn't
12 be accessible under Section 2 of the Data Access Law?

13 A. No, I don't believe so.

14 Q. Every safety critical feature?

15 A. Yes, sir.

16 Q. Without authorization by the OEM?

17 A. Yes, sir.

18 Q. Okay.

19 MR. LINDER: Can we please show slide 2.

20 Q. Mr. Bort, what do we have here?

21 A. So this is under current law. Each OEM manages their own
22 authentication and authorization as they choose, and so the OBD
23 ports are standardized, but I have them here in two different
24 colors to connote that there are still manufacturer -specific
25 components that would be off of that port as well.

1 Q. And are the different keys in cars, are these -- these are
2 different OEMs at the top and the bottom?

3 A. Yes, sir.

4 Q. Let's go to slide 3, please.

5 What would change if you were in the first half of
6 Section 2 of the Data Access Law that requires standardization
7 and no authorization by OEMs?

8 A. So I've removed the OEMs from having any part of the key
9 control, so inherently there is no control over the limited
10 authorization to the vehicle.

11 Q. And so am I understanding the graphic correctly that, in
12 your view, anyone would have access to anything on the vehicle?

13 A. Yes, sir.

14 MR. LINDER: Can we please put up slide 4.

15 Q. Okay. I want to focus your attention, if I may, on the
16 second half of Section 2 of the Data Access Law, the one after
17 the "unless" clause, which permits -- which permits OEMs, if
18 they insist on having authorization, to do it only by an
19 unaffiliated entity. Do you see that language in Section 2 of
20 the Data Access Law?

21 A. Yes, sir.

22 Q. What are we looking at in this graphic?

23 A. Okay. So here we have each of the OEMs from the previous
24 graphic where -- that we had -- that they each had their own
25 key system. Now the key system needs to be standardized and

1 managed by a third party. A third party can be a single entity
2 or a few entities, but it is the notion of a third party. That
3 third party, now independent of the OEMs, manages
4 authentication and authorization to what would be a
5 standardized interface, including not just the OBD-II port as
6 it is standardized today, but those additional manufacturer
7 functions and all of the vehicle networks.

8 Q. Are you aware of any such entity that currently exists
9 that could currently perform this function?

10 A. No, sir.

11 Q. And if it hypothetically did exist, what would be the
12 cybersecurity concern about it?

13 A. So you -- one, you've now created a common vulnerability
14 by standardizing the process of going back to what kind of
15 security research would need to be done to compromise this, I
16 would only need to undermine one process as opposed to each of
17 the individual OEM key systems.

18 The second part is the consolidation of those keys in
19 a single entity or a few entities would be an incredibly
20 lucrative target.

21 Q. Thank you.

22 MR. LINDER: Can we please go to the next slide.

23 Q. Okay. I want to turn, if I can, your attention to Section
24 3 of the Data Access Law.

25 Do you see in the -- now I can't see it.

1 Do you see where it requires that a platform be
2 interoperable, standardized, and open access?

3 A. Yes, sir.

4 Q. What do you -- what do you understand that to require of
5 OEMs?

6 A. The -- so the Rosetta Stone needs to be established where
7 I can have a standard dictionary be able to speak to all of the
8 functions across all of those makes and models, and with it
9 being open access, there's no authorization, so all of the
10 systems need to be just open for access.

11 Q. Does any such platform like that exist currently on any --
12 sorry -- on any vehicle of which you're aware?

13 A. No, sir.

14 Q. And from a cybersecurity perspective, what would be the
15 impact if that existed?

16 A. Yeah, this is where I find this particularly scary.

17 So the cars, other than what we've seen in labs or
18 academic research, the primary threat model to the way that the
19 ecosystem has defended itself to this point mostly leads itself
20 to theft. So it's just there's an easier way to replay attacks
21 with keys or copy keys so that I can be able to steal a car,
22 because it's not possible to be able to do more of the
23 Hollywood scenario that I was describing earlier where I could
24 effect all of those OEMs and all these makes and models. It's
25 an incredibly resource intensive and expensive endeavor.

1 And so by standardizing that, I've reduced having to
2 learn all of that which goes all the way from physically
3 rebuilding all those architectures for testing to reverse
4 engineering to understanding all those components to then
5 actually developing the security research for the proof of
6 concept to actually weaponize that kind of an idea. Now I only
7 have to do it once, and that once is a common vulnerability
8 across all cars.

9 Considering that -- I mean, we certainly know the
10 world that we live in today, I think the two potential risks to
11 that would be the more mundane, which is the scourge of
12 ransomware that has been ongoing for the last year and a half
13 that cars would find themselves very much in the crosshairs for
14 that because it's such an easy accessible, now commoditized
15 access; and then of course I think that adversary nations,
16 looking at it from a nation state and military perspective,
17 would consider that an incredibly interesting vulnerability
18 that was introduced into the U.S. market.

19 Q. Focusing your attention on the last sentence of Section 3,
20 what do you understand that section -- sorry, that sentence to
21 require of OEMs?

22 A. Access shall include -- that one, the last sentence?

23 Q. I believe so, yes.

24 A. Access shall include the ability to send commands to any
25 vehicle components, if needed, for purposes of maintenance,

1 diagnostics, and repairs.

2 Q. Yes, so the ability -- yes, what does that mean to you?
3 What does that require OEMs to do and make available?

4 A. So that ability to send particular messages to an ECU on
5 the vehicle networks has to be available.

6 Q. And what are the cybersecurity risks about making that
7 available on a standardized open access and interoperable
8 platform?

9 A. That compartmentalization that I had to -- whatever that
10 was is gone now, so I can send direct to safety critical
11 systems.

12 Q. Like braking, steering, and acceleration?

13 A. Yes, sir.

14 Q. Okay. Focusing on the mobile application that's called
15 for in the middle of the Section 3 of the Data Access Law, do
16 you see that?

17 A. Yes, sir.

18 Q. From a cybersecurity perspective, what risks would having
19 that kind of mobile platform -- sorry, that mobile application
20 in the system create?

21 A. Sure. So, first, mobile application would connote that
22 there are two forms of access across the threat model, either I
23 am internet accessible and so the phone, you know, uses its
24 internet accessibility through a cloud of some type to speak to
25 the car, or the phone would talk in an RF manner of like

1 Bluetooth to trade information with the vehicle.

2 The first risk is that by definition a phone is an
3 untrusted system. What that means is that I as the
4 manufacturer of the application cannot -- I have to -- I have
5 to assume that the device is potentially compromised in a state
6 of compromise, because I didn't build that device, I don't
7 manage that device, so my application has to be able to work
8 and be safe in that function.

9 We've now brought the consumer into the threat model
10 because however that customer has used that phone with other
11 applications that they've put on that phone, which is -- those
12 applications could be malware, there's a problem where malware
13 has been found in both the Apple and Google stores, so that is
14 a common attack factor that we see on phones. So we've now
15 introduced an untrusted system for an application that's going
16 to have potentially critical safety potential on the vehicle as
17 a part of the scope.

18 Q. And this graphic that's up in front of you, which is slide
19 number 5, which we will be sharing with the Court a copy of,
20 what are we looking at here?

21 A. So standard OBD-II connector here, that part is
22 standardized. We now have to have the --

23 THE COURT: Just so I'm clear, because I'm not, it
24 bears the number -- the pagination 6. Is that slide number 5?

25 MR. LINDER: It is, Your Honor. There's a title

1 slide, I apologize.

2 THE COURT: All right. Okay.

3 MR. LINDER: We'll probably remove the title slide
4 when we give it to you, since I've identified them a page off
5 of this.

6 THE COURT: So, in any event, we'll have a concordance
7 of some sort that will --

8 MR. LINDER: We'll clean this up, yes, Your Honor.

9 BY MR. LINDER:

10 Q. Sorry. What are we looking at, Mr. Bort?

11 A. So the -- the access is currently through standardized
12 OBD-II port. The OBD-II port would now have standardized
13 access to all of the components of the vehicle, hence, the
14 concept of authorization is turned to nothing. All the vehicle
15 networks in this case, it's listed as mechanical data, but
16 we're -- they're synonymous, but mechanical data is how it's
17 phrased in Section 3 of the law.

18 Q. Let me ask you about mechanical data and the phrase
19 "otherwise related to." You've read NHTSA's submission from
20 Friday, correct?

21 A. Yes, sir.

22 Q. And you saw their opinion of how broad the scope is of
23 that phrase, correct?

24 A. Yes, sir.

25 Q. What's your view of what that encompasses?

1 A. So the -- so mechanical data is all of the electronic
2 components tied to the physical components of the vehicle.
3 With the inclusion of the phrase "and otherwise," that seems to
4 keep it very open-ended to go even beyond that.

5 My concern that I had put in my report was that that
6 might also include particular engineering or IP from the OEMs
7 that are part of the design, maintenance, and operation of the
8 vehicle that would have been outside of probably what was
9 considered the considered scope.

10 NHTSA expressed similar concern of how that would
11 affect critical safety features.

12 Q. Yes.

13 You were asked on cross-examination about secured
14 gateways. Do you recall that?

15 A. Yes, sir.

16 Q. Remind me, what is a secured gateway and how does it
17 function?

18 A. So a secured gateway is there to provide segmentation. It
19 is used as the ability to separate the clean, which is the
20 operation of the vehicle itself, from the dirty, which is the
21 potential of an unknown accessor source or introduction of any
22 kind of data.

23 Q. Like telematics?

24 A. Like telematics, yeah, telematics being of course internet
25 accessible. The secured gateway was really built in tandem --

1 it was designed in tandem to make sure that the telematics
2 wasn't introducing additional risk.

3 Q. Okay. And you testified on cross-examination that an OEM
4 could retain its gateway and still comply with the Data Access
5 Law; do you recall that?

6 A. Yes, sir.

7 Q. What did you mean by that?

8 A. I meant that you could still have that device there, it
9 just wouldn't be able to function in the exact same manner of
10 preventing -- of managing authorization, but the device would
11 still be present.

12 Q. Physically?

13 A. Physically.

14 Q. Could it still act as the firewall that it's intended to
15 act as?

16 A. No.

17 Q. And if it couldn't do that, and you couldn't remove
18 the clean -- you couldn't separate the clean from the dirty
19 side, what's the cybersecurity risk again?

20 A. You've now increased your surface area, so the risk
21 aperture is broadened to anybody who can find your car on the
22 internet.

23 Q. You're familiar with the phrase "certificate-based
24 authentications"?

25 A. Yes, sir.

1 Q. What are they?

2 A. Certificate-based authentication is the application of
3 digital code to sign, to create a session or code itself.

4 Q. What's your view of whether the Data Access Law would
5 require OEMs to modify how they use certificate-based
6 authentication?

7 A. I'm sorry, can you say that again?

8 Q. Yeah. What impact would the Data Access Law have on
9 certificate-based authentication?

10 A. Well, you wouldn't be able to have certificate-based
11 authentication because you're removing authorization from the
12 requirements.

13 Q. What's the result of that? What could happen?

14 A. You're -- you're now -- anybody could potentially access
15 and put any code on any system.

16 Q. Including safety critical systems?

17 A. Including safety critical systems.

18 Q. You are familiar that the AG's experts have proposed a
19 number of solutions to comply with the Data Access Law,
20 correct?

21 A. Yes, sir.

22 Q. Okay. Disabling telematics is one of them. Do you know
23 whether that's doable?

24 A. Again, from the perspective that, yes, we can do anything.

25 My concern would be about, one, how do we do that at

1 scale across all of those OEMs? And then, two, what would be
2 the potential unintended consequences of doing that?

3 So we are aware of particular safety features, like
4 intrusion detection, like immobilizer, like recovery and
5 tracking unlocking firmware, over-the-air updates that would no
6 longer be available. But, again, going to how that would be
7 done and what would -- what else would be done beyond that we
8 can conjecture at the high level of the report, I would counsel
9 that that would need to be tested to be sure.

10 Q. How about a telematiccally enabled dongle, would that be
11 a secure solution to comply with the Data Access Law?

12 A. I wouldn't phrase it as a secure solution. I would say
13 that you shifted the internet accessibility to a location that
14 is not typically internet accessible, and so the current
15 security design that was built around the physical access to an
16 OBD-II port that is now internet accessible would require
17 redesign.

18 Q. How about SVI, are you familiar with what SVI is?

19 A. Yes, sir.

20 Q. What is it?

21 A. SVI is creating that Rosetta Stone of here is going to be
22 the standard for how you interface with the vehicle.

23 Q. Across all OEMs, is that what you mean by a Rosetta Stone?

24 A. All OEMs. Yeah. Sorry, the current implementation of SVI
25 was actually -- yes, yes.

1 Q. You can finish.

2 A. No, I'm good.

3 Q. Okay. And let me just ask, are you familiar with any
4 implementations of SVI?

5 A. No, sir.

6 Q. And you were asked on cross-examination about SCMS; what
7 is that?

8 A. SCMS was a certificate-based trust system for -- designed
9 for V2X.

10 Q. And has that been implemented at scale?

11 A. No, sir.

12 Q. Okay. So do you think OEMs could ever comply with the
13 Data Access Law safely?

14 A. I would go with what I said earlier, like, again, man on
15 the moon kind of thing. I think if we thoroughly redesigned
16 and considered a new threat model, then it's possible that we
17 would accept a different level of risk and be compliant. It's
18 not the kind of thing I think that you could do tomorrow.

19 Q. How long do you thing it would take?

20 A. I think it would take about at least five years.

21 What I would add on to the testimony earlier, which by
22 the way, I independently came up with five years, was not at
23 all -- I didn't know what he was going to say what he was going
24 to say when I came up with my number in preparation, is that
25 the threat modeling aspect in correlation to all of the

1 testimony of we have to now agree to a standard, we have to
2 implement the standard, we have to redesign it, we have to make
3 the whole supply chain go, that would also work in concert with
4 the threat modeling and risk assessment which would have to
5 progress with it along with it.

6 Q. If OEMs had to comply today with the Data Access Law, is
7 there any way that they could do so and still protect safety
8 critical systems?

9 A. No, sir.

10 MR. LINDER: Thank you.

11 MR. HASKELL: May I, Your Honor?

12 THE COURT: Yes, you may.

13 MR. HASKELL: Thank you.

14 RECROSS-EXAMINATION BY MR. HASKELL:

15 Q. Sir, on your redirect examination you were asked about the
16 number of OEMs for which you have information about their
17 vehicle architecture. Do you remember that?

18 A. Yes, sir.

19 Q. And you initially testified several; is that right?

20 A. Yes, sir.

21 Q. And then when you were asked for a little more
22 specificity, you said around five; is that correct?

23 A. He asked me five, and I said around that.

24 Q. And one of those is General Motors, correct?

25 A. Yes, sir.

1 Q. And one of those is FCA, correct?

2 A. Yes, sir.

3 Q. And in fact, there are upwards of 20 OEMs that are
4 currently selling cars in the United States; is that right?

5 A. Yes, sir.

6 Q. You testified on redirect about -- about security by
7 obscurity. Do you remember that?

8 A. Yes, sir.

9 Q. And you testified, the way I wrote it down was you
10 testified that preventing easy access to something isn't going
11 to make it secure. So that's your testimony here?

12 MR. LINDER: I think that misstates the testimony,
13 Your Honor, but --

14 THE COURT: Well, it's up to the witness.

15 A. I was using the concept to educate on what security by
16 obscurity was.

17 Q. And then you also testified a bit about the Miller and
18 Valasek hack on the redirect. Do you remember that?

19 A. Yes, sir.

20 Q. And I think you had testified to me on cross-examination
21 that it was your understanding that Mr. Miller and Mr. Valasek
22 had physical access to that vehicle that they hacked, correct?

23 A. Yes, sir.

24 Q. And is it fair to say that their physical access to that
25 vehicle gave them the ability to conduct tests and research

1 about that vehicle before performing the hack, yes?

2 A. Yes, sir.

3 Q. And that made it easier for them to do the hack, yes?

4 A. Yes, sir.

5 Q. And then you also testified just a few moments ago towards
6 the end of your redirect examination that under the -- it's
7 your opinion that under the Data Access Law, the central
8 gateway module couldn't be retained in a way that it can
9 continue to act as a firewall. Do you remember that?

10 A. Yes, sir.

11 Q. And in fact, it's your understanding that the central
12 gateway module can be programmed to filter messages, or not,
13 based on who's sending the message, yes?

14 A. Yes, sir.

15 Q. And it's your understanding the central gateway module can
16 be programmed to filter messages based on the intended
17 recipient of the message; is that right?

18 A. Yes, sir.

19 Q. And it's also your understanding that the gateway can be
20 programmed to filter messages based on the content of the
21 message, yes?

22 A. Yes, sir.

23 Q. And in view of those capabilities, the risk that you see
24 in a gateway needing to comply with the Data Access Law is that
25 it's going to be asked to handle a lot more than it was

1 initially designed for; is that right?

2 A. It could go either direction. It could either be
3 required -- so to comply I feel like, one, that new ecosystem
4 would now encompass a much greater requirement, which is where
5 I had provided in the deposition that explanation of increased
6 resources that would have to be engineered in this new model,
7 or the other which is there is no access or -- I'm sorry, no
8 authorization managed in which case the gateway function has no
9 firewall.

10 Q. Can I ask you -- do you still have the -- our binder in
11 front of you?

12 A. Yes, sir.

13 Q. Great. Can I ask you to turn to page 202 of your
14 deposition testimony.

15 To begin at line 19.

16 You were asked: Okay. But what I'm getting at here,
17 is, is it your understanding that a gateway can be programmed
18 to filter messages based on a criterion of the sender of the
19 message?

20 You answered: Yes, it can.

21 Did I read that correctly?

22 A. I'm sorry, sir, I wasn't on the page yet.

23 Q. Let me know when you are, please.

24 A. Ah, 202 --

25 Q. 202, beginning at line 19.

1 A. Line 19, okay.

2 Q. Are you there?

3 A. Yes, sir.

4 Q. Okay. And so you were asked there: Okay. But what I'm
5 getting at here is, is it your understanding that a gateway can
6 be programmed to filter messages based on the criterion of the
7 sender of the message?

8 And you answered: Yes, it can.

9 Did I read that right?

10 A. Yes, sir.

11 Q. On line 24 you were asked: Is it your understanding that
12 a gateway could be programmed to filter messages based on the
13 content of the message?

14 And you answered: Yes.

15 Did I read that correctly?

16 A. Yes, sir.

17 Q. The next line, you were asked: And is it your
18 understanding that the gateway could be programmed to filter
19 messages based on the recipient of the message?

20 You said: Yes.

21 Did I read that right?

22 A. Yes, sir.

23 Q. The next question you were asked: And is it your
24 understanding that the gateway could be programmed to filter
25 messages based on a combination of those factors?

1 | And you answered: Yes.

2 | Did I read that right?

3 | A. Yes, sir.

4 Q. And the next question, beginning on line 12 of page 203,
5 is: That being the case, what is your reason for believing
6 that the gateway couldn't be combined with the connection that
7 you say is required by the Data Law in order to maintain a
8 separation of trust levels?

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9           You answer:  So what you're were talking about there
10  is using software to be able to make that logic happen.
11  Software requires hardware resources to be able to effectively
12  function.

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13 So, the risk we're talking about here is a secured
14 gateway suddenly being required to -- will handle a lot more
15 processing and traffic than it was initially designed for,
16 which would cause the gateway to fail to enforce.

17 We're now at the beginning, the top of page 204 of the
18 transcript.

19 Did I read that correctly?

20 | A. Yes, sir.

21 Q. And then the follow-up question was: I get it. Or
22 alternatively, could an OEM redesign its architecture to
23 incorporate a bigger, better, more powerful, more capable
24 gateway?

25 | And you answered: Yes. That might be one

1 requirement. We described a batter coming to the plate.
2 Because a batter is a ten-year-old playing Little League
3 doesn't mean you can suddenly throw him in the major leagues
4 and expect the same performance, even though there are similar
5 functions.

6 Did I read that correctly?

7 A. Yes, sir.

8 Q. And then the -- and then the final question of this line
9 on page 204: I understand. So to continue that metaphor, if
10 an OEM were to equip its architecture with a major league
11 gateway, could such a gateway, at least theoretically, be
12 capable of maintaining separation based on trust levels, even
13 in the presence of the direct data connection that you speak
14 about?

15 You answer: Yes. It is possible that that and
16 potentially other defense-in-depth considerations. So I don't
17 think a gateway alone would be all that would be required but
18 that plus other defense-in-depth rearchitecting, yes, that's
19 possible.

20 Did I read that correctly?

21 A. Yes, sir.

22 MR. HASKELL: I have no further questions, Your Honor.

23 THE COURT: All right. Thank you.

24 You may step down. Thank you.

25 So are you prepared to -- we're a little bit faster,

1 were you prepared to go forward now with Mr. Garrie?

2 MR. NADOLENCO: We are, Your Honor.

3 THE COURT: Okay.

4 MR. NADOLENCO: We're happy to keep going. We'll call
5 Daniel Garrie as our next witness.

6 THE COURT: All right.

7 MR. NADOLENCO: And we'd move into evidence his
8 affidavit.

9 THE COURT: Yes, it's received on the same basis that
10 I received the other ones.

11 MR. NADOLENCO: Thank you, Your Honor.

12 DANIEL GARRIE, sworn.

13 THE CLERK: Please state your full name and spell your
14 last name.

15 THE WITNESS: Daniel Garrie, G-a-r-r-i-e.

16 It sounds really loud to me, I can't --

17 MR. HASKELL: You're fine.

18 THE WITNESS: Okay.

19 MR. HASKELL: Totally fine.

20 THE COURT: You may proceed.

21 CROSS-EXAMINATION BY MR. HASKELL:

22 Q. Good afternoon, Mr. Garrie. It's good to see you again
23 after having met you at your deposition a couple of weeks ago.

24 Mr. Garrie, one aspect of your testimony to the Court
25 today, is it fair to say, is a criticism of the proposal to

1 disable telematics?

2 A. I wouldn't state it as a criticism; it's my understanding
3 and interpretation.

4 Q. You offered testimony -- you offered an opinion concerning
5 the possibility of disabling telematics; is that correct?

6 A. I did.

7 Q. And in fact, a car's telematics module comprises an
8 interface between the car and external sources; is that
9 correct?

10 A. Yes.

11 Q. And as such, a car's telematics module actually comprises
12 a potential attack factor for the car; is that correct?

13 A. Yes.

14 Q. And in that way, the addition of a telematics module to a
15 vehicle actually increases the vehicle's attack surface; is
16 that correct?

17 A. Yes, it can.

18 Q. Now, you identify in your testimony to this Court five
19 features that you claim would be impacted by disabling
20 telematics; is that correct?

21 A. Yes.

22 Q. The first of those is over-the-air updates, yes?

23 A. That is correct.

24 Q. And it's not your opinion, is it -- let me restart that.

25 It's not your opinion that a vehicle that lacks the

1 capability to accept over-the-air updates is out of compliance
2 with federal vehicle safety regulations; is that correct?

3 A. That is correct.

4 Q. Nor is it your opinion that a vehicle that lacks emergency
5 crash notification capability is out of compliance with federal
6 safety regulations; is that correct?

7 A. To the extent I understand the regulations, that is
8 correct.

9 Q. Nor is it your opinion that a vehicle that is not equipped
10 with an intrusion detection system is out of compliance with
11 federal vehicle safety standards; is that correct?

12 A. That is correct.

13 Q. Nor is it your opinion that a vehicle that is not equipped
14 to telematically send data about malfunctioning components is
15 out of compliance with federal safety standards; is that
16 correct?

17 A. That is correct, to the extent I understand the --

18 Q. And is it also not your opinion that a vehicle that lacks
19 a stolen vehicle recovery feature is out of compliance with
20 federal safety regulations, that's not your opinion, right?

21 A. That is correct.

22 Q. In fact, the way -- the way NHTSA's regulations work, they
23 actually require vehicle components to work in a certain
24 fashion; is that right?

25 A. My understanding is that NHTSA has requirements that

1 brakes are able to operate in a certain function and certain
2 other, steering and other sort of safety critical, to the
3 extent I understand that. The brakes have to work when you
4 push on them.

5 Q. Right. But NHTSA doesn't itself have any specific
6 cybersecurity requirements; isn't that right?

7 A. Not beyond the fact that the brakes have to work.

8 Q. Now, you testify, this is paragraph 112 of your affidavit,
9 about the secure vehicle interface. And what I want to
10 focus on -- well, what you say in paragraph 112 of your
11 affidavit -- let me know when you've flipped to it.

12 A. I'm at 112.

13 Q. And in paragraph 112, you testify that secure vehicle
14 interface, or SVI, cannot be relied upon to comply with Section
15 3 of the Data Law because SVI is a theoretical framework that
16 has not been tested or implemented and might not deliver safe,
17 secure, Data Law compliant systems. The technology to
18 implement SVI does not exist. OEMs' negative evaluations of
19 SVI and SVI's lack of adoption in the automotive industry
20 indicate that implementing SVI standards is not a secure and
21 reliable means of complying with the Data Law.

22 Did you see where I read that correctly?

23 A. I did.

24 Q. And then just after that, you cite Trial Exhibit 23. Do
25 you see that?

1 A. I do.

2 Q. And so I'd like to, if we can please put up on the screen
3 Trial Exhibit 23, and you can also flip to it, there's a tabbed
4 copy of it in your binder.

5 So the first three pages of Trial Exhibit 23 are a
6 cover email, the fourth page is a slip sheet indicating the
7 document was produced natively, and we can go past those.

8 The document that you're citing in paragraph 112 of
9 your affidavit actually begins on the fifth page of trial
10 Exhibit 23; is that correct?

11 A. Yes, that's correct.

12 Q. Okay. And so can I ask you to flip to the sixth page of
13 Trial Exhibit 23, which is the portion of the slide deck that
14 has the number 2 in the bottom right corner of it. I'm sorry
15 for the pagination here. But the slide that begins "Summary of
16 Issue."

17 Are you looking at that?

18 A. I am.

19 Q. Now, that page doesn't contain the OEM evaluation of SVI
20 that you're referring to in your trial testimony, does it?

21 A. That is correct.

22 Q. Let me ask you to flip forward two pages -- we'll come
23 back to page 3, but I want you to go to page 4, please, the one
24 that's titled, "The ACA Messaging on Telematics."

25 That page doesn't contain the OEM evaluation of SVI

1 that you're referring to in your testimony; is that correct?

2 A. That is correct.

3 Q. Can I ask you to go to the next page that has page number
4 5 at the bottom right corner, it's titled "Current
5 Massachusetts State of Play."

6 Are you there, sir?

7 A. Yes.

8 Q. And that page doesn't contain the OEM evaluation of SVI
9 that you're referring to in your testimony, does it?

10 A. No.

11 Q. Can I ask you to flip to the next page that's numbered
12 page 6. The heading is "Timeline."

13 That page doesn't contain the OEM evaluation of SVI
14 that you're referring to in your testimony, does it?

15 A. No. I believe it's in the email that the PowerPoint's
16 attached to, but I'd have to read the email.

17 Q. Can I ask you to flip to the next page that's numbered
18 page 7, titled "Auto Innovators Engagement Plan and Costs."

19 That page doesn't contain the OEM evaluation of SVI
20 that you're referring to in your testimony, does it?

21 A. That is correct.

22 Q. The next page, number 8, is just a heading page that's
23 titled "Additional Background."

24 That's not the SVI evaluation, is it?

25 A. No, it's not.

1 Q. The next page has a number 9 at the bottom. It's titled
2 "Who?"

3 That page doesn't contain the OEM evaluation of SVI
4 that you're referring to, does it?

5 A. That is correct.

6 Q. And the final page of Trial Exhibit 23, numbered page 10,
7 the heading at the top says "Brief History of Massachusetts
8 Right to Repair Issue."

9 That page doesn't contain the evaluation of the SVI
10 that you're relying on, does it?

11 A. That is correct.

12 Q. Let's go all the way back to the beginning of Trial
13 Exhibit 23.

14 And let me ask to you take a minute, take as long as
15 you need, and please read the email there, and let me know when
16 you've done so.

17 (Pause.)

18 A. I've skimmed it.

19 Q. That email doesn't contain the OEM negative evaluation of
20 SVI that you're referring to, does it?

21 A. No, it does not.

22 Q. Let's go back to the page that we skipped earlier. It's a
23 page of the slide deck number 3, the title is "Potential Risks
24 to FCA If Enacted."

25 Can you let me know when you flip to that, sir.

1 A. When they put it on the screen. I'm here.

2 Q. There we go.

3 And so secure vehicle interface is mentioned in the
4 one, two -- third bullet point down that begins, Instead ACA is
5 proposing -- I suppose the following bullet point that begins
6 FCA's secure gateway is also referring back to the previous
7 bullet point, that is the OEM negative evaluation of SVI that
8 you're relying on in your testimony; is that right?

9 A. With respect to the OEM piece of the statement, correct.

10 Q. So you're aware that SVI consists of three ISO standards,
11 correct?

12 A. Can you please repeat the question, sorry.

13 Q. Sure. You're aware that SVI consists of three ISO
14 standards; is that right?

15 A. Yes, that is correct.

16 Q. And the first one is ISO 21177. You didn't read ISO 21177
17 in connection with preparing your rebuttal opinion for this
18 case, did you?

19 A. That is correct, but --

20 Q. ISO 21184, you didn't read 21184 in connection with
21 preparing your rebuttal opinion for this case; is that correct?

22 A. That is correct.

23 Q. I'm sorry, did you say that is or is not?

24 A. That is, that is.

25 Q. Yes. And ISO 21185, it's the third standard that

1 comprises SVI, you didn't read that in connection with forming
2 your rebuttal opinion for this case; is that correct?

3 A. Yes.

4 Q. Now, you testify at paragraph 114 of your affidavit --
5 this is page 29 of your affidavit -- you testify that
6 implementing SVI would likely create substantial issues with
7 securing the systems and ensuring that they operate properly;
8 is that correct?

9 A. That is correct.

10 Q. And in truth, sir, you aren't aware of what kind of risks
11 implementation of SVI would create or not correct -- or would
12 no create; is that correct?

13 A. Can you please reask the question?

14 Q. Sure. In truth, you aren't aware of what kind of risks
15 implementation of SVI would create or not create; is that
16 correct, sir?

17 A. That is correct, because it's not a standard that is used
18 today in the --

19 Q. In fact, sir, you didn't perform any risk assessment of
20 SVI in connection with forming your opinion in this case; isn't
21 that also right?

22 A. The SVI standard from where I sit isn't complete, so I
23 couldn't assess it in its totality.

24 Q. And so you did not perform any risk assessment of SVI in
25 connection to forming your opinion on this case, correct?

1 A. Yeah, that is correct.

2 Q. Now, you testify -- this is at paragraph 70 of your
3 affidavit, page 18. You testify that Sections 2 and 3 of the
4 Data Access Law require manufacturers to remove themselves from
5 chains of authorization and authentication; is that your
6 testimony?

7 A. It is.

8 Q. And "authentication" means verifying the identity of a
9 person or a system that makes a request; is that correct?

10 A. Yes.

11 Q. "Authorization," in contrast, means providing access to
12 certain things; is that correct?

13 A. Yes.

14 Q. And, thus, authentication as a concept is different from
15 authorization; is that right?

16 A. Yes, but they're interchangeable.

17 Q. The two concepts are different; is that right?

18 A. Yes, but they require one, without the other doesn't
19 really allow to be effective.

20 Q. So moving on to paragraph 71 of your affidavit, which
21 begins at page 18 and goes into page 19, you testify that in
22 order to comply with Sections 2 and 3 of the Data Law, vehicle
23 OEMs have to remove several safety critical cybersecurity
24 controls; is that your testimony?

25 A. That is.

1 Q. And then you go on to identify three of them, right?

2 A. That is correct.

3 Q. One is the gateway, yes?

4 A. Yes.

5 Q. The second is challenge/response protocols, yes?

6 A. Yes.

7 Q. And the third is wireless interface controls, yes?

8 A. Yes.

9 Q. Okay. And so you go on to testify -- now looking at
10 paragraph 79, beginning -- actually, can we just see page 21 of
11 the affidavit, please?

12 You then go on to testify that redesigning and
13 replacing the gateways is not feasible for model year '22
14 automobiles because it takes approximately three to eight years
15 to design, verify, validate, test, and implement the component
16 as complex as a gateway; is that your testimony?

17 A. Yes.

18 Q. And so you then testify in paragraph 80 that based on your
19 experience and review of materials in preparing your testimony,
20 redesigning the gateway would require vehicle OEMs to redesign
21 the entirety of the automobile models' cybersecurity defense
22 which would be expensive and time-consuming; is that your
23 testimony?

24 A. That is correct.

25 Q. And then, moving on to paragraph 81 of your affidavit, you

1 testify, even more importantly, it is doubtful that vehicle
2 OEMs could ever do so securely for reasons that you then go
3 on -- well, you say because the Data Law conflicts with the
4 cybersecurity principles like defense in depth and security by
5 design; is that your testimony?

6 A. It is.

7 Q. And so speaking just about the technical possibility of
8 redesigning automotive architecture to comply with the Data
9 Access Law, it's your testimony, sir, isn't it, that -- that an
10 OEM could do that even if it took several years to do so; is
11 that correct?

12 MR. NADOLENCO: Objection to the extent it misstates
13 the testimony he just read.

14 THE COURT: Okay. Well, I'll permit it as questioning
15 whether that is his opinion now, whether or not he stated it
16 earlier, it was reflected in other testimony.

17 A. Can you please ask the question again.

18 MR. HASKELL: Is it possible for me to ask the
19 reporter to read it back?

20 THE COURT: I'd prefer that you do, and do it without
21 reference to perhaps inconsistencies and so on, but what it is
22 that you want to get out of him, ask the question.

23 BY MR. HASKELL:

24 Q. Sir, is it your testimony, as you sit here today, that as
25 a technical matter an OEM could architect and design a vehicle

1 to comply with the Data Access Law even if it took that OEM a
2 period of time to do so, correct?

3 MR. NADOLENCO: I apologize, also incomplete
4 hypothetical.

5 THE COURT: Okay. If you can answer that question, go
6 ahead.

7 BY MR. HASKELL:

8 Q. Is that your testimony, sir?

9 A. There are a lot of unknowns in the law today, like who the
10 third party is and all these other moving parts, but if I were
11 to read into the law the right -- that the third party existed,
12 which it doesn't exist, and all of the other pieces, it would
13 be possible.

14 Q. Now, you testify in part of your opinion about the defense
15 in depth, yes?

16 A. Yes.

17 Q. And specifically, this is paragraph 47 of your affidavit,
18 you testify that defense in depth is a multilayered defense
19 strategy where several independent countermeasures are
20 implemented in a device to provide aggregated protection
21 against different attack vectors, and that's your testimony
22 today, sir?

23 A. Yes.

24 Q. Now, the essence of defense in depth is the use of
25 multiple layers; is that correct?

1 A. Yes, using different -- yes.

2 Q. And defense in depth as a concept doesn't prescribe the
3 identity of the specific cybersecurity layers that must be
4 used; is that correct?

5 A. Yeah, it's -- correct.

6 Q. Nor does the defense-in-depth concept prescribe the
7 specific ways those different controls must be layered or
8 combined together; is that correct?

9 A. That is correct.

10 Q. And in fact, there can be multiple ways to combine
11 different layers of cybersecurity protection that each achieve
12 a defense in depth; is that correct?

13 MR. NADOLENCO: Again, incomplete hypothetical.

14 THE COURT: All right. He may answer the question.

15 BY MR. HASKELL:

16 Q. Would you like to hear the question again, sir?

17 A. Yes, please.

18 Q. In fact, there are multiple ways that different layers of
19 cybersecurity protection might be combined that each achieve a
20 defense in depth; is that correct?

21 A. It is possible -- yes, that's correct, you can layer
22 different pieces of security --

23 Q. And the proper choice --

24 A. -- to implement defense in depth.

25 Q. And the proper choice of layers, as well as choice of how

1 to combine them, really depends on the specific threats that
2 the system faces; is that correct?

3 A. It depends on that, as well as other factors.

4 Q. Now, you also testify, sir, about security by design, and
5 specifically you testify in paragraph -- or excuse me,
6 specifically you testify about security by design of
7 cyber-physical systems; is that right?

8 A. That is correct.

9 Q. And an automobile is a cyber-physical system, right?

10 A. Today's automobile is, yes.

11 Q. Now, you testify that security by design involves
12 beginning to -- beginning to consider cybersecurity from the
13 very nascent stages of the vehicle design; is that correct?

14 A. Yes, that is -- I don't know nascent, but at the
15 beginning.

16 Q. And I'm sorry, I don't mean to -- just so we have it on
17 the screen, paragraph 47 of your affidavit, page 13.

18 And so you testify that security by design involves
19 beginning to consider cybersecurity from the very nascent
20 stages of the vehicle design; is that right?

21 A. It's part of the engineering process, correct.

22 Q. Yeah, and that security by design involves an engineering
23 process specifically one that can enable security requirements
24 to be properly identified, specified, and traced to effective
25 countermeasures. That's your testimony, sir?

1 A. Yes.

2 Q. And under this engineering process, security is supposed
3 to be integrated during the process, design and consistently
4 applied by the engineers involved in the process; is that
5 right?

6 A. Yes.

7 Q. And so is it accurate, sir, to say that security by design
8 describes a type of approach to cybersecurity; is that correct?

9 A. It's a methodology from which you build and engineer,
10 not -- so, yes, I guess.

11 Q. And so security by design does not connote a particular
12 method of cybersecurity control, correct?

13 A. That is correct.

14 Q. Rather, it connotes a design development process that
15 addresses security requirements from the get-go, correct?

16 A. That is correct.

17 Q. Now, you submitted both an initial -- or you signed, I
18 should say, both an initial expert report and a rebuttal expert
19 report for this case; is that correct?

20 A. That is correct.

21 Q. And in the -- I'll just focus on the initial report here.
22 Just focusing on the initial report, you cited a number of
23 sources in that report; is that correct?

24 A. As the rules require, I put anything I considered or
25 evaluated.

1 Q. You cited documents received from General Motors; is that
2 correct?

3 A. That is correct.

4 Q. You cited documents received from FCA, yes?

5 A. That is correct.

6 Q. And you also cited secondary sources like treatises and
7 journal articles and the like; is that correct?

8 A. They were -- yes, that is correct.

9 Q. And you deemed the sources that you chose to cite in your
10 report to be reliable authorities, yes?

11 A. To be something I reviewed in the process of drafting the
12 report.

13 Q. And you deemed them to be reliable, right?

14 MR. NADOLENCO: Asked and answered.

15 THE COURT: Just so there's clarity, the question is:
16 Was a necessary condition for them being listed as secondary
17 sources that you decided that they were reliable?

18 THE WITNESS: No, I didn't.

19 THE COURT: The next question.

20 BY MR. HASKELL:

21 Q. Now, in your testimony at paragraph 58 -- can we get that
22 up?

23 Thank you.

24 And actually, I'm sorry, we're looking at the portion
25 of 58 that appears on the next page, on page 16 of your

1 affidavit.

2 You testify that wireless interface controls refer to
3 the controls used to secure wireless connections to automobiles
4 via mobile phones and the manufacturer data center.

5 Did I read that correctly?

6 A. That is how I define them in the report.

7 Q. And you also testify in the next paragraph, paragraph 59,
8 that wireless interface controls typically include routing all
9 mobile phone commands through the manufacturer data center to
10 limit the automobile's number of connection points.

11 Did I read that correctly?

12 A. That is correct.

13 Q. And so my question is, and you may have just already
14 answered this a moment ago, that first sentence on paragraph 59
15 of your testimony, wireless interface controls being routing
16 mobile phone commands through the manufacturer data center,
17 that's the definition of wireless interface controls that you
18 used in your opinion and in testimony; is that correct?

19 A. Yes.

20 Q. Now, if we go to paragraph 71 of your affidavit, which
21 begins on page 18, you also testify that complying with the
22 Data Access Law will require OEMs to remove the
23 challenge/response protocols that authorize diagnostic
24 processes. Did I read that correctly?

25 A. You did.

1 Q. And if we look at paragraph 84 of your affidavit, which is
2 on page 22, you testify -- you define "challenge/response
3 protocol" to mean a type of access control in which the user
4 attempting to access the protected system is presented with a
5 challenge or prompt that must be responded to with the correct
6 response for access to be granted. And so that is the
7 definition of challenge/response protocol that you used in
8 rendering this opinion; is that correct?

9 A. And that is correct.

10 Q. Now, at the time you formed your opinion for this case,
11 you didn't know about mode 27 of a scan tool; is that correct?

12 A. No, that's not correct.

13 Q. So we have in a tab in your binder in front of you your
14 deposition transcript -- sir, you gave a deposition in this
15 case, yes?

16 A. I did.

17 Q. And you took an oath at the beginning of that deposition
18 to tell the truth; is that correct?

19 A. That is correct.

20 Q. And in fact, I believe you testified at that deposition
21 there was no reason that you could not tell the truth that day
22 during your deposition. Do you remember that?

23 A. That is correct.

24 Q. Okay. And if I can ask you to flip to page 99 of the
25 transcript of your deposition, beginning on line 15, you were

1 asked: Are you familiar with mode 27?

2 And there is an objection.

3 And you answered: Mode 27, can you clarify what you
4 mean by mode 27?

5 Did I read that question and answer correctly?

6 A. Yes.

7 Q. And then the next question is: Sure. Scan tool mode 27,
8 is that a concept you are familiar with?

9 And you answer: In the context of automotive?

10 And I said, Yes.

11 And you answered: Is it a scan tool? I don't know
12 mode 27 particularly off the top of my head as I sit here.

13 Did I read that correctly?

14 A. Yes.

15 Q. Now, in forming your opinion about the need to remove
16 challenge/response protocols in response to the Data Access
17 Law, you didn't actually consider any alternatives to an OEM
18 removing those challenge/response protocols, correct?

19 A. That is correct.

20 Q. And, Mr. Garrie, you're obviously getting -- not
21 obviously.

22 I think you testify in your affidavit that you are
23 compensated for your time spent on this case; is that right?

24 A. That is correct.

25 Q. Is it fair to say that your bills for this engagement go

1 well into the six figures; is that correct?

2 A. That is correct.

3 MR. HASKELL: No further questions at this time, Your
4 Honor.

5 THE COURT: All right, Mr. Nadolenco.

6 MR. NADOLENCO: Thank you, Your Honor.

7 REDIRECT EXAMINATION BY MR. NADOLENCO:

8 Q. Good afternoon, Mr. Garrie.

9 A. Good afternoon.

10 Q. You were asked some questions about the -- about
11 telematics being an attack vector. Do you recall those
12 questions?

13 A. I do.

14 Q. Isn't one of Craig Smith's proposed solutions here a
15 telematically equipped dongle?

16 A. Yes.

17 Q. Doesn't that have two attack vectors on it?

18 A. Yes.

19 Q. It has physical access to the actual vehicle plugged in,
20 correct?

21 A. Yes.

22 Q. And it also has the telematic system?

23 A. That is correct.

24 Q. Has Mr. Smith, to your knowledge, tested his telematically
25 equipped dongle the way, for example, GM has tested OnStar?

1 MR. HASKELL: Objection, foundation.

2 THE COURT: If he knows, he can answer.

3 A. I believe he testified that he's used dongles at least
4 upwards of 20 times to hack vehicles and one remote or
5 wirelessly enabled dongle as well to hack a vehicle.

6 Q. To your knowledge has he --

7 THE COURT: Just hold up, I'm sorry.

8 MR. HASKELL: I have to move to strike. He's
9 testifying to testimony that somebody else gave.

10 THE COURT: I think it was -- as I understood it, it
11 was Mr. Smith who gave that testimony, and this is about his
12 knowledge of Mr. Smith. So I overrule the objection.

13 BY MR. NADOLLENCO:

14 Q. And to your knowledge, has Mr. Smith tested the security
15 on his telematics portion of his telematicially equipped
16 dongle?

17 A. I don't know.

18 Q. You were asked some questions about testimony with regard
19 to Section 2 compliance.

20 Do you see cybersecurity risks if an OEM is no longer
21 part of the authorization process?

22 A. Yes.

23 Q. What risks do you see?

24 A. There are multiple risks, the first risk being the OEM by
25 being allowed to determine the difference between an engineer,

1 an OEM engineer, versus a repair shop versus an individual
2 user, what they can actually -- what they're allowed to do is
3 an important security feature, as a defense in depth uses
4 authorization security controls at multiple levels.

5 In addition, there are other issues that come into
6 play. By removing them, effectively anybody would then be
7 allowed to do whatever they wanted when they were able to get
8 on.

9 Q. And why is that?

10 A. Authorization is what you can do, so if nobody -- there is
11 no authorization by the OEM, then people would have the ability
12 to do as they saw fit.

13 Q. What cyber protections would be impacted by removing the
14 OEM from the authorization chain?

15 A. The secured gateway, the challenge/response protocol, the
16 wireless interface controls.

17 Q. And how would they be impacted? And you can take them one
18 at a time if you -- if you wish.

19 Let's start -- let's, in fact, do that.

20 How would challenge/response protocols be impacted?

21 A. Well, effectively, the challenge/response protocol works
22 to -- as it was testified earlier -- I don't want to repeat
23 everything -- but, effectively, the OEM says this is a
24 legitimate -- they're authorizing the software to be installed.
25 If you remove them from that process with getting that key, as

1 was testified earlier from GM, there's no way to actually know
2 that the firmware that's being installed on the vehicle is
3 indeed doing what it's supposed to.

4 So safety critical systems like the brakes or the
5 acceleration or any of the others could potentially be
6 reprogrammed.

7 Q. And I will skip secured gateway, I believe we've heard
8 plenty of testimony on secured gateway.

9 What about wireless security controls?

10 A. So, as was testified, the mobile device is inherently not
11 a -- is assumed not to be secure, and OEMs have invested
12 substantial resources in creating an ecosystem to ensure that
13 when you click the button on your phone and the car starts,
14 that it works safely and securely. But that's a much different
15 concept than having access to all the vehicle networks, to all
16 of the mechanical data. You're talking -- so you'd have to
17 remove a litany of the security controls, plus, in all
18 likelihood you'd have to remove the OEM who is actually vetting
19 the messages in a large part before they would get sent to the
20 phone for most of that functionality that's currently offered
21 today.

22 Q. What about Section 2's standardization requirement? For
23 starters, are you aware of any such standardized system
24 existing?

25 A. No such standardized system exists today.

1 Q. And what's the impact of the standardization requirement
2 from a cybersecurity perspective?

3 A. Well, rather than having to hack an individual vehicle,
4 OE -- like instead of just having to hack the Ford Focus,
5 right, and then I'd have to hack a Mercedes, now I just hack
6 one of them and I can basically gain access because I've
7 effectively standardized all of the vehicle on-board diagnostic
8 functionality creating obviously a much easier way to
9 compromise or -- the cybersecurity for the vehicle owner and
10 operator.

11 Q. What changes to cybersecurity would you have to make to
12 comply with Section 2 standardization requirement?

13 A. I mean, you'd effectively have to either disable or
14 redesign the way the current gateway is built and operated
15 because of standardizing, as my colleague, the Rosetta Stone,
16 to create that, you would have to change the functional way the
17 gateway is operating.

18 Q. Let me ask you, please, to look at Section 2's language
19 about the unaffiliated entity. You alluded to this in some of
20 the questions you were asked on cross.

21 Does that entity exist?

22 A. No, and that -- it does not.

23 Q. And describe any impact on vehicle cybersecurity having an
24 unaffiliated entity handle access to vehicle has?

25 A. You're effectively going to transfer for every -- I think

1 it was 20, 20 OEMs in North America, or all of the keys to
2 access all of the cars will be sitting in one place. That's
3 assuming that the entity that doesn't exist has the appropriate
4 security controls, governing structures, operational controls,
5 and other pieces that OEMs spend and work diligently to protect
6 and secure.

7 And so -- and that's also assuming the complexity of
8 transferring all of the keys is actually -- can be achieved and
9 monitored on a regular basis, because that's also a huge
10 laborious process.

11 Q. And is there a cybersecurity risk to having all that
12 managed by one or a couple handful of entities?

13 A. Yeah, you're effectively moving from 20 OEMs to two or
14 three -- or essentially one entity versus 20 that will -- you
15 attack the one, you have access to all 20.

16 Q. You were asked some questions about whether it was
17 possible to comply from a technical standpoint with the Data
18 Access Law. Do you recall those questions?

19 A. I do recall those questions.

20 Q. Do you believe it can -- it is possible to comply safely
21 with the Data Access Law?

22 A. I do not believe today that it is possible to comply
23 safely with the law.

24 Q. And don't OEMs have to certify the safety of their
25 vehicles?

1 A. Yeah, they have to certify that the brakes work when you
2 press on them and that the acceleration works and that the
3 steering works, and that I don't think they can safely comply
4 with the law.

5 Q. Let me read you something, please, Mr. Garrie, and I'd
6 like you to react to it.

7 If in practice the Data Law's requirements of remote
8 access to motor vehicles' telematic system creates a safety
9 issue constituting a defect under the Safety Act, then the act
10 would require the motor vehicle manufacturer to recall and stop
11 selling vehicles compliant with that requirement.

12 Do you believe that the requirement of remote access
13 to -- through the telematic system creates an unreasonable
14 safety risk under the Data Access Law?

15 A. Yes.

16 Q. Can you explain that?

17 A. Well, Section 2 and Section 3 effectively remove a lot of
18 the security controls that are currently necessary to ensure a
19 safe operation of the telematics unit, and without those
20 security controls, sort of think it like Jenga. If you pull
21 out enough of the blocks, eventually it's going to collapse,
22 and I think you're pulling out way too many blocks.

23 THE COURT: My cultural references are shallow and
24 narrow, so what's Jenga?

25 THE WITNESS: It's a game where you stack -- I play

1 with my wife and my five-year-old and seven-year-old, and you
2 stack up basically using logs. You start with basically a
3 bunch of logs all stacked up, and then you each push one out
4 and then you push another one out until the building collapses.

5 THE COURT: Okay, thank you.

6 BY MR. NADOLENCO:

7 Q. A couple more questions, Mr. Garrie.

8 I'm going to read to you again a statement and then
9 ask you a question.

10 The Data Law requires motor vehicle manufacturers to
11 take actions that potentially pose serious cybersecurity risks
12 by opening uncontrolled access to vehicle firmware that
13 executes safety critical function.

14 Do you agree that that is the effect of the Data
15 Access Law?

16 A. Yes.

17 Q. Can you explain that?

18 A. Again, you're removing key -- like was testified today by
19 the chief security officer of GM, GM provides -- there's a
20 third party providing that key to say that this piece of
21 firmware that's going to update the brakes is actually the
22 right piece of software and it gets pushed out. Without that
23 level of involvement, you're effectively going to put the
24 vehicle at risk substantially, because anybody theoretically in
25 some fashion could do that.

1 Q. Based on what you know of SVI, is SVI a solution?

2 A. No.

3 Q. Why not?

4 A. I mean, it -- it's missing -- it doesn't have a data
5 dictionary, it is not complete in the sense that it's never
6 been tested, evaluated or assessed or rolled out or deployed in
7 any wide-scale fashion.

8 MR. NADOLENCO: No further questions, Your Honor.

9 THE COURT: All right.

10 Mr. Haskell, anything?

11 (Pause.)

12 MR. HASKELL: No questions.

13 THE COURT: All right.

14 You may step down, Mr. Garrie. Thank you.

15 THE WITNESS: Thank you.

16 THE COURT: So --

17 MR. NADOLENCO: Your Honor, we would -- at this point,
18 we're out of witnesses, so we would rest after we move in the
19 deposition.

20 THE COURT: Okay. So let me -- I understand that, and
21 not a surprise, although I always like to grab whatever time I
22 can get, but I know what the exhibit numbers are, you know what
23 the exhibit numbers are, but the people who actually have to
24 keep a record formally are having considerable difficulty doing
25 that because of the way in which I've organized the receipt of

1 these.

2 What I'm going to ask you to do is to take each one of
3 the exhibit numbers that are to be introduced and list the
4 witness through whom they were introduced here, including those
5 that we have as I think of sponsoring witnesses and so on.

6 Ms. Beatty will have a better idea of what exactly
7 what she wants, and that's for the court reporters, too, who
8 are doing kind of back and forth on this, and so it's important
9 that they be able to include for your purposes, as well as
10 everybody else's, a list of the exhibits that came in through
11 what witness and that sort of thing and on what page. Now,
12 what page they came in on for most all of them is when that
13 document was tendered, but, in any event, we'd like to have
14 some place where people other than us can figure out what it
15 is, and including the people who really can figure out what's
16 going on, and they can't figure it out now.

17 So if you can do that together, that would be helpful,
18 and maybe by tomorrow have what we have so far on this.

19 MR. NADOLENCO: Your Honor, we're happy to do that.

20 THE COURT: Now, with respect to the depositions,
21 transcripts, they haven't been offered yet, to my knowledge. I
22 don't know if you're going to offer several --

23 MR. NADOLENCO: Yes --

24 THE COURT: -- or one of them.

25 MR. NADOLENCO: -- we would offer the transcript that

1 the Court ruled on the objections on Taylor Mitchell.

2 THE COURT: Yes.

3 MS. KOBICK: And, Your Honor, I wish to restate our
4 objections to that deposition testimony.

5 THE COURT: Well, certainly repetitiveness has been
6 part of this trial, so I recognize the repetitive objection; it
7 has already been ruled on repetitively. Trust me, you're
8 secure on that one.

9 MS. KOBICK: Thank you, Your Honor.

10 MR. NADOLENCO: And, Your Honor, just a qualified rest
11 because we do have some orphan exhibits not tied to a
12 particular witness, and I believe we'll have some witnesses --
13 some exhibits that come in through the cross of the Attorney
14 General's witnesses, but --

15 THE COURT: Okay. Well, I just want to be sure that
16 we've got a clear record of what has been received --

17 MR. NADOLENCO: Yeah --

18 THE COURT: -- to date.

19 MR. NADOLENCO: -- we can help, we'll work with the
20 Attorney General's office this evening to put that together.

21 THE COURT: But I think we're all better off when we
22 talk to Ms. Beatty about how to do it right. I know I am, so
23 if you can talk to her after the hearing today.

24 MR. NADOLENCO: Absolutely.

25 THE COURT: So then we're going to have the -- tidying

1 up for the case in chief of the plaintiff and then the two
2 experts of the -- well, all of the witnesses of the defendants.

3 And I would think that we'd be able to get through
4 them tomorrow. Any reason --

5 MR. HASKELL: The way we've been going, that seems
6 very reasonable to us.

7 THE COURT: Okay. And so then I want to think about
8 so-called hot tub and what good that will do and when we'll do
9 it. Probably Thursday, but if you say no, we'd like to catch
10 our breath, Friday. I mean, all of a sudden, time has opened
11 up for me in all of this. But I'm thinking that that's what I
12 want do.

13 MR. HASKELL: So, Your Honor, where would that leave
14 Wednesday if the defense is able to finish its case tomorrow?

15 THE COURT: Yes, yeah, that would -- oh, I'm sorry, I
16 wasn't even -- I've got two days. What a gift. You talk about
17 when you want do it. I mean, you've got schedules and that
18 sort of thing. I push very hard, but I don't want somebody to
19 say you just pushed me to oblivion. That's why I want to step
20 back a little bit. On the other hand, I don't want scripted
21 experts in the hot tub; I'm going to scrub that off them right
22 away it that happens. What I really want them to do -- I'm
23 glad to hear that Mr. Bort and Mr. Smith like each other,
24 respect each other, that's the beginning of wisdom -- so I'd
25 like them to have a conversation of why they've chosen one

1 particular position over another and why there are shortcomings
2 with it and back and forth between them. That's my view.
3 That's not to disregard Mr. Garrie or Mr. Romansky. I just
4 haven't heard that kind of testimony.

5 But I assume that I'm going to be dealing with that
6 sort of thing.

7 Now, is it going to be round robin? I don't know.
8 Yeah, that is four people. Maybe I should say mahjong, which
9 is the cultural reference that I could use.

10 But, in any event, you know, how we're going to
11 choreograph a conversation between people who are at the top of
12 their game in their -- from all I can see, in their
13 professions, talking about why they've chosen -- apart from who
14 engaged them -- why they chose one position as opposed to
15 another, that's what I'd like to do.

16 MR. HASKELL: All sounds good, Your Honor.

17 If you don't mind, it might make sense, as we have
18 that conversation with plaintiff's counsel, figure out a
19 schedule that --

20 THE COURT: Right.

21 MR. HASKELL: -- we might want to suggest.

22 We also loop in that topic we left hanging last week
23 about what we want to do by the way of post-trial briefing and
24 argument.

25 THE COURT: And so let me offer some views, not final

1 ones.

2 Of course we got the response from the government as
3 to its participation here, and I do want you to have the
4 opportunity to address that obviously in closing arguments, not
5 necessarily with the writing, but maybe with the writing.

6 Here's what I'm thinking: I wouldn't necessarily want
7 you to rush around to try to get final findings and conclusions
8 that are keyed to the testimony here done at the risk of
9 everything else. I would think that what I would want is
10 argument -- and I can use the existing findings and conclusions
11 and my notes and that sort of thing just to get clear in my
12 mind, or clearer in my mind what the issues are.

13 Then I think we probably would have a second round of
14 argument maybe a couple of weeks out when you've had a chance
15 to go through and tidy up the findings and conclusions, make
16 them referent to the actual exhibits that were introduced in
17 the testimony that was introduced, and also the possibility of
18 raising some additional findings or supplemental findings that
19 you might think would be helpful in this case to your own case,
20 based on the evidence that's submitted, and it is you pretty
21 much know what the evidence is going to be, but you didn't know
22 everything, and you didn't know what the focus might be in this
23 area.

24 So -- and that's kind of I've got it in my mind that.
25 I thought a bit over the weekend about what do I do with the

1 government, the way in which the government presented itself
2 and, as you know, I've thought of not just relying on
3 section 517, but also on Tooey.

4 I don't think it lends itself to my thoughts about how
5 Tooey might properly be interpreted in the appropriate area.
6 If there was somebody there who was working in the bowels of
7 EPA and said, I know how things are done, I'd feel differently,
8 but what they've said is, We don't know, here's some thoughts
9 for the Court to consider, everybody to consider. That's their
10 statement of interest, although it's a little tidier than that.

11 In any event, I don't see myself doing that part of
12 it, I'll rest with -- I'll take what I got and work with it,
13 that means you've got to work with it, too. It's not -- they
14 don't purport to decide the question of or offer opinion,
15 ultimate opinion on the question of preemption, even as to the
16 safety act, and certainly not as to everything else, and I
17 don't necessarily brush aside the Clean Air Act simply because
18 they didn't want to say anything about it. On the other hand,
19 they didn't reinforce the position with respect to the safety
20 act and everything else.

21 And of course the other issues are those questions of
22 dismissal, as I said, I think Van Buren v. The United States,
23 which was the computer act case that came down last week -- was
24 it last week? I think so. I think this evaporated whatever
25 claim there was, that's my basic view, but maybe you'll have an

1 imaginative view of telling, oh, no, it's still alive here, but
2 I doubt it. And then we'll talk about the other ones.

3 But, so there are three things going on, now that I've
4 said that. Number one, any closing argument on what we heard
5 here in this case, but you don't have to rush to get things
6 tidied up for purposes of final findings and conclusions.

7 Number two, a motion to dismiss, which may be a
8 separate day or the same day, but just so we all are prepared
9 as to those other counts, three through eight -- is that right?
10 Or seven, eight is a remedy thing.

11 And then, finally, once I've thought it through some
12 more based on the very helpful closing arguments you give me
13 and my review of the record, I think I want do it again, that
14 is, have a closing which I focus you on things that are on my
15 mind before I kind of bring it to a conclusion, and that can be
16 a couple of weeks out.

17 I'm sorry, go ahead.

18 MR. HASKELL: This might be especially salient for the
19 folks who are here from California, that that first argument,
20 you know, the so-called closing, would the Court be open to
21 doing that potentially later this week if we wrap up the
22 evidence on Wednesday or so?

23 THE COURT: Sure.

24 MR. HASKELL: And we can figure out what --

25 THE COURT: You know, you're the masters and

1 mistresses of your schedules. I'm-- Ronald Reagan used to say
2 the most dangerous words in the English language is, I'm here
3 from the federal government, and I'm here to help you. I'm
4 here from the judiciary, and I'm here to help you. But however
5 you want to set it up, I'll accommodate here. I've blocked
6 this out as I've said. So, you know, I don't want to increase
7 transactions costs for trying this case; I don't want to
8 interfere with people's ability to be with their families and
9 that sort of thing, so if that works, great, we'll do that.

10 Okay. So you'll -- tomorrow morning you'll tell me
11 what you want to do in terms of schedule, but you won't leave
12 the courtroom until you have satisfied Ms. Beatty.

13 THE COURT: And that may be a long time.

14 Okay. So we'll be in recess at this point.

15 (Court adjourned at 4:19 p.m.)

16 - - - - - CERTIFICATION - - - - -

17 We certify that the foregoing is a correct transcript
18 of the record of proceedings in the above-entitled matter to
19 the best of our skill and ability.

20 /s/Kelly Mortellite
21 Kelly Mortellite, RMR, CRR
Official Court Reporter

June 14, 2021
Date

22 /s/Debra M. Joyce
23 Debra M. Joyce, RMR, CRR, FCRR
Official Court Reporter

June 14, 2021
Date